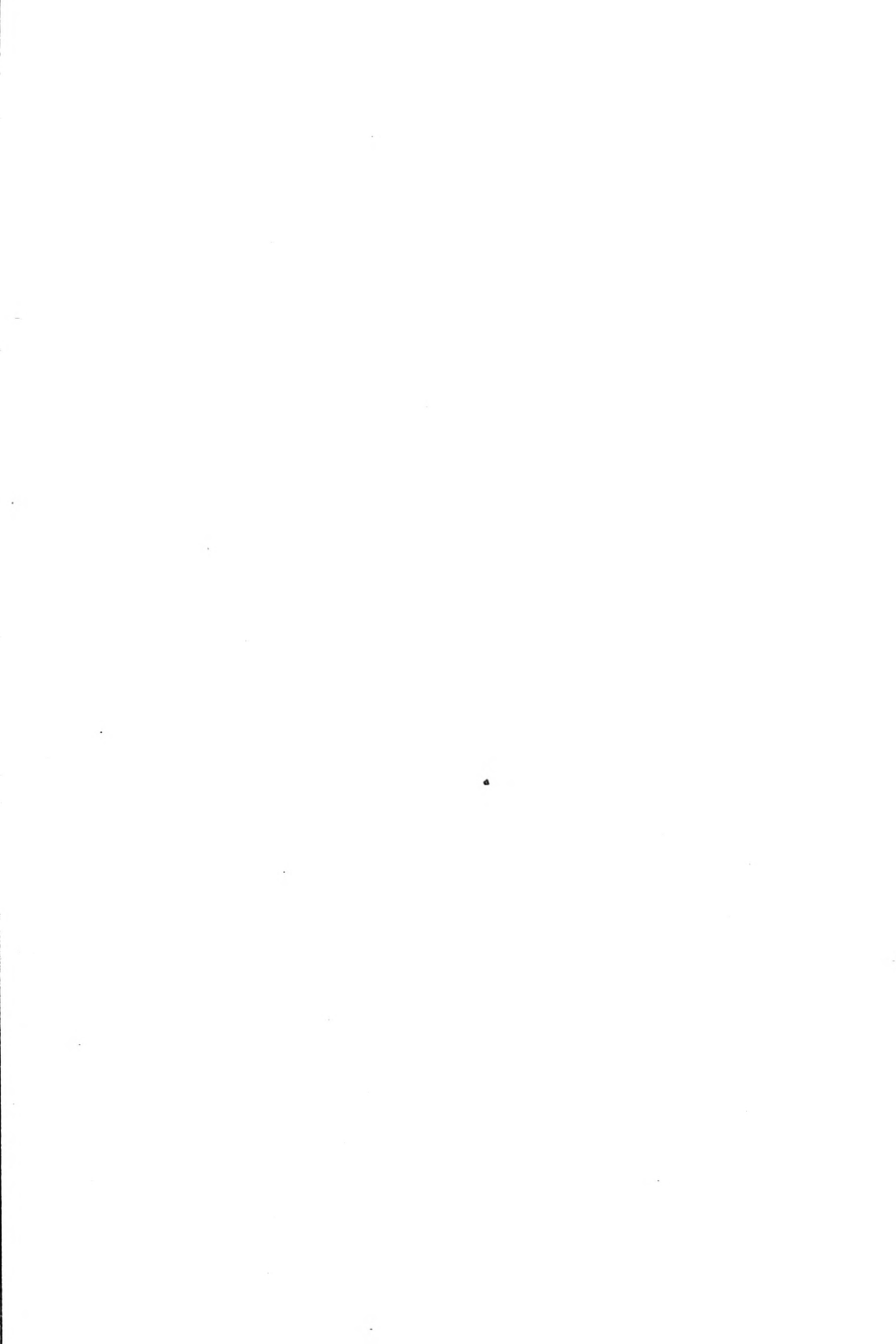




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CONTENTS.

B	
Balance Sheet, 1895	337
—, 1896	34
Baltic, The	277
Bananas in Uganda	96
Banda	48
Barcoo River	85
Bargru River	8
Barrier Reef	83
Barton Aqueduct	215
Bassia Parkii	49
Batavia River	85

(

	PAGE
Beauchief Abbey—J. F. Atkinson, J. P.	277
Bekwai	45
Bellenden Ker Range	84
Benzine	241
Benzoline	211
Berkeley Bay	80
Bewha River	8
Big Büm River	8
Binger, Colonel	47
Bires of Eastern Equatorial Africa—Rev. F. C. Smith, B.A., etc.	76
Birds of Uganda	69
Black, W. G., F.R.M.S.—Cape Rivers and Harbours	203
Black, W. G.—Captain Cook's Voyages, 1772-1781	198
Blake, J. C., F.R.G.S., F.I.Inst.—The Northern Capitals of Europe	292
Bluefields	153
Bolton, H., F.R.S.E.—The Geology of Rossendale	266
— The Physical Geography of North- East Lancashire, with Maps and Illustrations	188
Bompeh River	8
Bontuku	46
Books added to the Library, 1896	358
Books (see Reviews)	348
Borneo, British North	111
Botany Bay	91
Bowent	127
Bowes, Alderman Isaac The, Nicaragua Canal, as proposed by the Maritime Canal Company (Map)	142
— The Suez Canal (Map)	127
Bridgewater Canal Opened	206
Brisbane	116
— River	86
British, Ancient Volcanoes of Great Britain	84
British Association Meeting at Toronto, 1897	254
— New Guinea	107
— North Borneo	34
Brito	240
Budapest	8
Büm-Kittim River	8
Bün-laberg	90
Burdekin River	84
Burketown	89
Burnett River	85
Busoga	65, 74,

	PAGE		PAGE
I		Manchester, Practical Geography in	183
Iceland, Earthquakes in 1896	174	— Ship Canal: The Story in brief from 1768 to 1896—W. Burnett Tracy (maps and illustrations)	205
Imports, Queensland	100, 108	— The Whitworth Institute	314
India Ocean, Capt. Cook's Log, 1772-1780 ..	198	Mano River	8
Insula	38	Maps added to the Library, 1896	381
International Geographical Congress, 1895 ..	317	Maps (see Reviews)	
Ipswich (Queensland)	89	Marriage in Mendi	25
J		Martel, E. A., and the Speleological Society ..	108
Jackson, J. Hampden—The Niger River and Territories	55	Maryborough	90
Jemo	46	Mary River	90
Jerusalem	355	Masterman, J. S.—Geographical Associa- tion	268
Journals, etc., added to Library, 1896— British	392	Maxwell, Sir W., K.C.M.G.—The Results of the Ashanti Expedition, 1895-6 ..	37
— Colonial	394	Mayall, Derbyshire—Petroleum: its Use Mechanically, Commercially, and Medicinally	267
— Foreign	395	Mediterranean, Eastern, Tour in	350
— Missionary	394	Meetings, Reports of	256, 325, 349
Journey in Western China	59	Melbourne	114
— through African Forest	38	— Title Deeds of	124
Jong River	8	Members, List of	368
K		Mendi Agriculture	18
Kabras	79	— Cotton Growing and Manufacture ..	19
Kathi	62	— Country, The, and some of the Customs and Characteristics of its People—Rev. W. Vivian	1
Kampala	81	— Dyeing	20
Kanaka Labour Question	118	— Fishing	15
Kano	62	— Food Stuffs	11
Karoo Country	203	— Marriages	25
Kel River	203	— Population	1
Keiskamma River	203	— Products	10
Kikuyu	79	— Religion	32
Kintampo	59	— Secret Societies	29
Kittim River	8	— Slavery	12
Kola Nuts, West Africa	48	— Sport	10
Koonap River	203	— Women	13
Kowie River	204	Mengo	65, 80
Kukumu	48	Meteorological Instruments	161
Kumasi	38	Meteorology of Queensland—Clement L. Wragge, F.R.G.S., &c., Brisbane ..	128
Kwan-hsien	80	Mfway Cataract	10
Kyadondo	80	Mineral Oil	244
L		Mitchell River	85
Lancashire, Geographical Education	156	Mombasa	79
— Physical Geography of North-East ..	188	Moscow	308
Language of the Hausas	63	Mungo Park	55
Lagos Statistics	36	Murchison Bay	80
Lectures in Geography, Owens College, Manchester, 1895-6	264	Murray River	85
Leech, W. B.—Life at Bonthe, Sherbro Island, Sierra Leone	35	N	
Lesseps, Ferdinand de	137, 139	Naivasha Lake	79
Letter from Bishop Hannan, Uganda ..	79	Naples	351
Life in China—Rev. F. Galpin	274	<i>Natives of Swireah and British North Borneo. By Hs. Lung Koth. 2 vols. London</i>	348
List of Journals, Maps, Atlases, &c., 1896 ..	381	Navigable Rivers of Peru	167
— Members	368	Newby, John R., The Earthquakes in Ice- land, 1896. With map	174
Little Moreton Hall	288	New Guinea, British	107
Logs of Captain Cook, 1772-1789	198	— Sir W. Macgregor's Journey	201
Loko	62	New South Wales	111
M		Niagara Falls	170
Macgregor, Sir W., Journey in New Gui- nea—J. P. Thompson, F.R.S.G.S. ..	201	Nicaragua Canal	51
Machakos	79	— The—Abd. Isaac Bowes	149
Mackay	91	— Lake	54
Macpherson's Range	84	Niger River and Territories—J. Hampden Jackson	55
Mampong	41	N'koraza	50
Manchester Docks	216	Norman, General Sir H. W., G.C.B., &c., Queensland	82
— Lectures in Geography, Owens College, 1895-6	264	Normanton (Queensland)	94
		Northern Capitals of Europe—J. C. Baker, F.R.G.S., F.I.Inst.	295
		Norway, Christiania	294

	PAGE		PAGE
Note on Life at Bonthe, Sherbro Island, Sierra Leone. W. B. Leech	35	Reed, J. Howard—Practical Geography in Manchester	183
Notes of a Journey down the Dambe to Bukarest—Dr. Williamson:	260	Religion of the Mendies	32
— of a Tour in the Eastern Mediter- ranean—Dr. and Mrs. Oram	350	Report by the Lecturer in Geography in the Owens College, Manchester, 1895-6—Andrew J. Herbertson, F.R.G.S.	264
O		Report of the Society for 1895	325
Ochotona	54	— for 1896	339
Opening of Suez Canal	144	— of the "Victorians," 1895-6	330
Oram, Dr. and Mrs.: Notes of a Tour in the Eastern Mediterranean	350	— — 1896-7	340
Origin of Petroleum	237	<i>Report of the Navigability of the Eastern Rivers of Peru, by Capt. M. Meliton Curcio, et. Lima, 1895. 12 pp. and map.</i>	167
Owens College, Manchester, Lectures in Geography, 1895-6	264	Results of the Ashanti Expedition, 1895-6 — Sir W. Maxwell, K.C.M.G.	37
P		Revenue, Queensland	107
Pacific Ocean, Captain Cook's Log, 1772- 1780	198	Reviews and Notices of Books, etc., 136, 148, 167, 173, 187, 315, 324, 348	
Panama	48	Reykjavik	174
Partington Coal Basin	215	Rice Culture, Gold Coast	43
Perth (W. A.)	119	Rimmer, Alfred—Congleton	286
Peru, navigable rivers	167	Robinson, Rev. W.—The Work at the Hansa Association	60
Petroleum: its Use Mechanically, Com- mercially, and Medicinally	237	Rockhampton	91
<i>Philips' New Honda General Atlas of the World, Edit. by George Philip, 1896, London, 1897</i>	315	Roma	89
Physical Geography of North East Lanca- shire, with map and illustrations, Herbert Bolton, F.R.S.E.	188	Rosendale	191
Pioneer River	91	— Geology of	266
Point Danger	83	Rubber, West Africa	48
Population of Queensland	107	Rules of the Society	375
Port Douglas	93	Russia, Cronstadt	301
Potatoes in Uganda	66	— Moscow	308
Practical Geography in Manchester—J. Howard Reed	183	— St. Petersburg	303
Predicting the Weather	132	S	
Preinph, King	37	St. Petersburg	303
Proceedings of the Society	256, 325, 349	Salford Quays	218
Products of the Mendi Country	10	Samory, Mohammedan Chief	16
— Queensland	39	San Juan del Norte (Greytown)	151
<i>Produce of Turanum, Republic Argentina, Por P. Rodriguez, Marquette, 1896</i>	139	— River	54
Q		Sarawak	318
Queenland	116	Scott, Sir Francis	38
— Area	84, 107	Sea, Unification of Time at	316
— Climate	85	Secret Societies among the Mendies	29
— Constitution and Government	102	Schwa River	8
— Debt	96, 108	Sherbro Country	5
— Education	105	Ship Canal, Manchester	205
— Expenditure	97, 108	Sierra Leone, Bonthe	35
— Exports and Imports	100, 108	— Mendi Country	1
— General Sir H. W. Norman, G.C.B., etc.	82	— Statistics	36
— Geology	85	Slave Raiding, West Africa	64
— Meteorology	128	Slavery in Mendi Country	12
— Population	84, 86, 107	Smith, Rev. F. C., B.A., &c.—Birds of Eastern Equatorial Africa	76
— Products	39	— Bats and Elephants in Central Africa	74
— Railways	94	— Uganda	65
— Revenue	97, 107	Smyrna	354
— Statistics	107	Societies Corresponding, 1896, British	332
R		— Colonial	394
Railways, Manchester Ship Canal	218	— Foreign	395
— Queensland	91	— Missionary	394
Railway to Uganda	80	Sokoto	38, 64
Rats and Elephants in Central Africa—Rev. F. C. Smith, B.A., &c.	74	South Australia	115
		Speleological Society	108
		Sport in the Mendi Country	10
		Stanthorpe	89
		Stockholm	297
		Suez Canal—Ald. Isaac Bowes (map)	137
		— Cost	116
		— Dividends	145, 146
		— Opening	144
		— Traffic Returns	145
		Sulima River	8
		Swajali River	80
		Sweden, Stockholm	297
		Sydney	111
		Szu-Chuan	59

T

Visit to Dore

Vivian, Rev. W. The Mendi Country and some of the Customs and Characteristics of its People

Volcanoes, Ancient, of Great Britain

W

Wain

Wanandi Tribe

Wandorobo Tribe

Warrego River

Warwick (Queensland)

Waterloo Bay

Weather Forecasts

Wellesley Islands

Wells, Lionel B., M.Inst.C.E.—Canals and Navigable Rivers of England

West Africa, Ashanti

Western Australia

Western China, Journey in

Westmann Isles

Whitworth Institute, Manchester

Williamson, Dr.—Notes of a Journey down the Danube to Budapest

Women of Mendi

Work of the Hausa Association—Rev. W. Robinson

Wragge, Clement L., F.R.G.S., &c. Meteorology of Queensland

Y

Yearbook of the United States Department of Agriculture, 1896, Washington

York, Cape

Z

Zaria

PAGE

276

1

274

48

79

79

85

89

204

132

85

157

37

119

59

176

314

260

13

60

128

324

84

64

T

Tando River

Tarn Desert

Teaching of Geography

Thomson, J. P., F.R.S.G.S.—Sir W. Macgregor's Journey in New Guinea

Thomson River

Thursday Island

Time, Unification of, at Sea

Title Deeds of Melbourne

Toowoomba

Toronto, Meeting of British Association, 1897

Torres Straits

Townsville

Tracy W. Burnett—The Manchester Ship Canal. The Story in brief from 1708 to 1896 (maps and illustrations)

Traffic through Suez Canal

Treaty of Pommonah

U

Uganda

Uganda—Rev. F. C. Smith, B.A., F.L.S., F.R.G.S.

Unification of Time at Sea

Unyoro

Usoga

V

Vasco da Gama Fourth Centenary Celebration

Victoria

"Victorians," Manchester Geographical Society

— Report of the, 1895-6

— Report of the, 1896-7

Victoria, Title Deeds of Melbourne

V

V

MAPS AND ILLUSTRATIONS.

PORTRAITS—

Two Vice-Presidents of the Society—H. E. Cardinal Vaughan, and Rt. Rev. Mgr. C. J. Gadd, V.G.	Face Title
Richard Hanby of Manchester.....	261
Group of the Members of the Society at Saddleworth.....	267

AFRICA—

Sierra Leone Protectorate Sketch Map, prepared by the Rev. W. Vivian	3
— View of Freetown Harbour	2
— View of a Street in Sherbro	5
— View of a Sherbro Trading Station	7
— Crossing the Tia at Mano-Kwé	9
— View of the Mfway Rapids on the Big Bóm	11
— View on the Bo Road near Tikonko	17
— Mendi Women Spinning and Carding	20
— Mendi Women Dyeing.....	21
— A Mendi Loom	23
Cape Coast Colony and neighbouring territories. Sketch map	39
Niger Territories, Lagos and Gold Coast Colonies. Sketch map	57
Sokoto and surrounding districts. Sketch map	61
Sketch Map, Suez Canal	138

AMERICA—

Nicaragua Canal. Sketch map of proposed route	150
-----------------------------------------------------	-----

ASIA—

Snayrna, Interior of Church	355
Country Road on way to Jerusalem	350
Jerusalem—The Dome of the Rock	356
— The Double Twisted Column	357
— The Rent in the Rock	358

AUSTRALASIA

Australia and New Guinea, map. Scale 1/20,000,000	Face page 126
Queensland and New Guinea, map.....	Face page 82
Brisbane, environs. Sketch map	88

EUROPE

England, Rossendale, Map reduced from the Ordnance Survey.....	190
— Entering Bacup from Stacksteads	188
— Bacup, Old Sun, Broadelough	285
— Oldhouses, Underbank, Bacup	259
— Townley Hall	284
— Plan of Manchester Ship Canal and Docks	209
—	Face page 236
— View of No. 6 Dock, Manchester Docks.....	213
— Glimpse of Dock Railways, Manchester.....	219
— Berthing a Vessel in Manchester Docks	223
— Seven Storey Warehouses, Manchester Docks	227
— First Shed full of Cotton at Manchester Docks	233
— Second Storey of Three-Storey Shed, Manchester Docks.....	235
— Interior View of Three-Storey Shed, Manchester Docks.....	217
— Manchester, Former Residence of Headmaster, Grammar School, Long Millgate	273
— Staircase, Cheetham College	273
— Central Reference Library	365
— Old Blackfriars Bridge.....	271
— St. John's Church, Deansgate	360
— Owens College Meteorological Station, Whitworth Park.....	130
— Statue of Christ and the Children, Whitworth Park.....	363
— Whitworth Park Museum	262
— — One of the Galleries	363
— Hulme Hall (now destroyed)	272
— Salford, Technical Institute from Peel Park	292
— Stockport Church	282
— — Old Bank	283
— Prestbury from the North	290
— Church	289
— Beauchief Abbey Tower	278

IRELAND—

Sketch Map of the Earthquake District in Ireland, 1896	175
--------------------------------------------------------------	-----

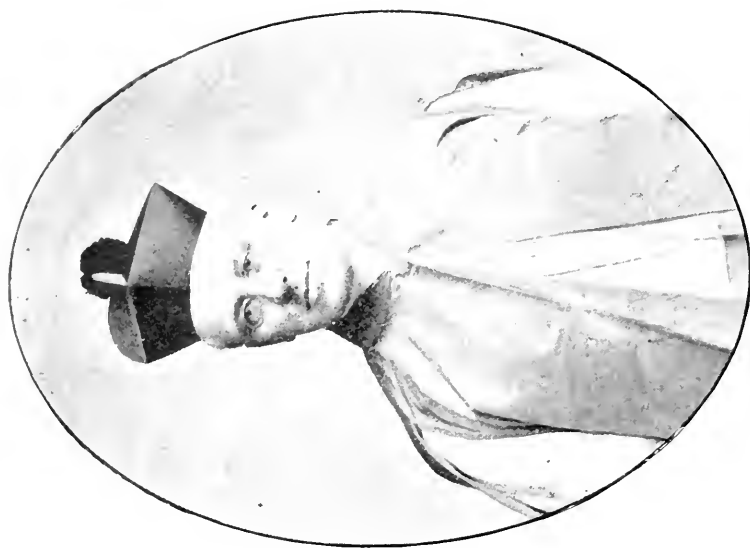
HUNGARY—

Saint Stephen's Procession at Budapest	261
King Stephen's Hand	262
Bridge Across the Danube from Buda to Pest	262
Ruins of Castle and Palace of Visegrad from the Danube	263

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THE RIGHT REV. MONSIGNOR C. J. GADD, V.G.

THE JOURNAL

OF THE

MANCHESTER GEOGRAPHICAL SOCIETY.

THE MENDI COUNTRY, AND SOME OF THE CUSTOMS AND CHARACTERISTICS OF ITS PEOPLE.

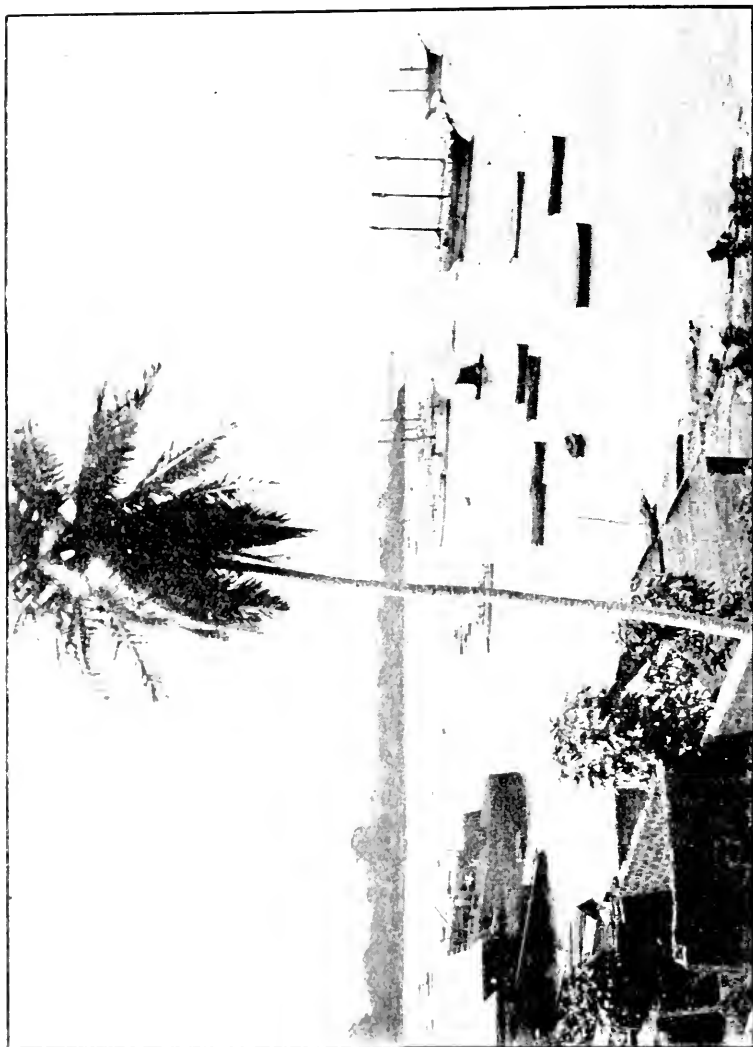
By REV. WILLIAM VIVIAN, late General Superintendent of Methodist Free Church
Missions in Sierra Leone.

THE Mendi country lies in the Hinterland of Sierra Leone. Judged in relation to its territorial extent, it is an insignificant portion of the great continent, but viewed in its contiguity to the colony, and the relation it must bear to its future commercial development, the Mendi country will be found an important part of the protectorate now being formally established. In proof of this we may cite the rapid growth of Sherbro, the natural outlet of Mendi trade. The country lies to the south-east of Sierra Leone, and in area, fertility, and population easily takes rank over any other portion of its Hinterland. It is very difficult to gauge its population, but it may be set down as at least 150,000, with the probability of rapid increase now that peace is properly established.

The Mendies are well known in Sierra Leone, their first representatives having been brought as slaves in the early days of colonial history. The returns for 1891 show that there is a Mendi contingent, several thousand strong, residing within the census area. They do good service as agricultural labourers, carriers, boatmen, and hammock bearers, being in the latter capacity most valuable in the narrow and tortuous roads of the African bush. They do not appear to be held in very great esteem by the Sierra Leoneans, who discount any service they may thus render by setting over against it a well-authenticated belief that the Mendies carry to perfection the aboriginal virtue of not taking anything beyond their reach. This feeling is so strong in Freetown that I have known the young Creoles sometimes carry indignation beyond the barriers of discretion, and indiscriminately flog every Mendi they could set hands on, even breaking into their houses and scattering their belongings.

VOL. XII.—Nos. 1-3—JAN. TO MARCH, 1896.

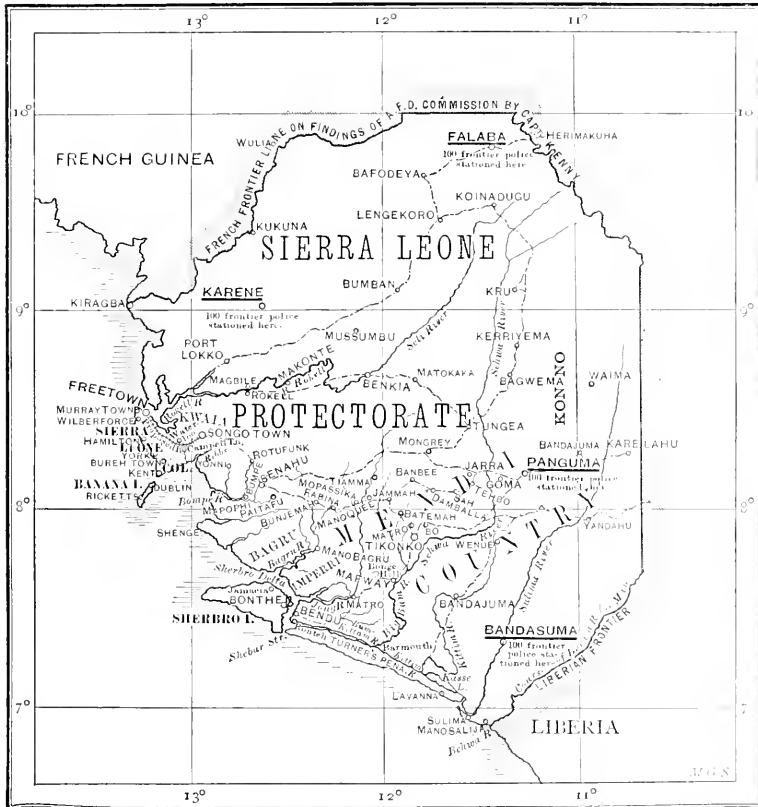
But the Mendies settled in Sierra Leone are scarcely the kind of persons by whom to form a just estimate of the people as a whole. The bulk of them have probably drifted into the colony seeking freedom from the irksome restraints of slavery ;



1.—FREETOWN HARBOUR, SIERRA LEONE.

others come for trade, and the remainder are young adventurers—fellows who come down seeking *Pookmoi navoo* (white man money), and who, with a strong lust for its possession, zealously add to the small rewards of labour the richer harvest gathered

by light-fingered tactics in the dead of night. Very few pure Mendies have risen above the level of the labour class in the colony, mainly, I suppose, because no very serious effort has been made to awaken in them any response to the social and moral ideals of a better life. The ruling ambition with the Mendi immigrant is to return to his own country enriched with



The Rev. W. Vivian has very kindly prepared this Sketch Map for the Society, probably the first map made of the Colony; it has been roughly compiled to illustrate this paper. It is based upon Sierra Leone, No. 1,016, Intel. Div., W.O.; a map issued by the Colonial Office for the use of schools in Sierra Leone; a map furnished by Governor Cardew to accompany his paper read before the Liverpool Chamber of Commerce; and the writer's notes of his own journeys. The text describing Major Kenney's work on the former Anglo-French Boundary Commission is inaccurately spread out so as to cover the N. W. Frontier which was fixed by the agreement of January 21, 1895.

a competence which will make possible to him the fullest enjoyment of those native institutions which are so dear to his pagan heart.

As to the home-land of the Mendies—the Mendi country proper—it is, of course, difficult to speak in the absence of exact

information, and in the face of tribal frontiers which have changed so frequently under the influence of inter-tribal wars, and other vicissitudes. But speaking roughly and tentatively, I am sufficiently accurate, for the purposes of this paper, *if the present sphere of Mendi occupation* be delimited in the following way, including towns having names of a distinctly Mendi origin, and peoples speaking the Mendi language with inconsiderable dialectic variations.

Starting from Senahû (Yoko's) the line should run through Tiamma on the Tia River to Mongrey, then by Tungea up the Sehwa Valley to Kerriyemma; from thence turning to the south-east through Wiama (scene of the tragic collision between the French and English troops) to Kare-Lahû, then down to Behwa or Mano River to Mano Salijah, and thence in a north-westerly line through Imperri and Mano Bargru back to the starting point at the head of the Bompeh River.

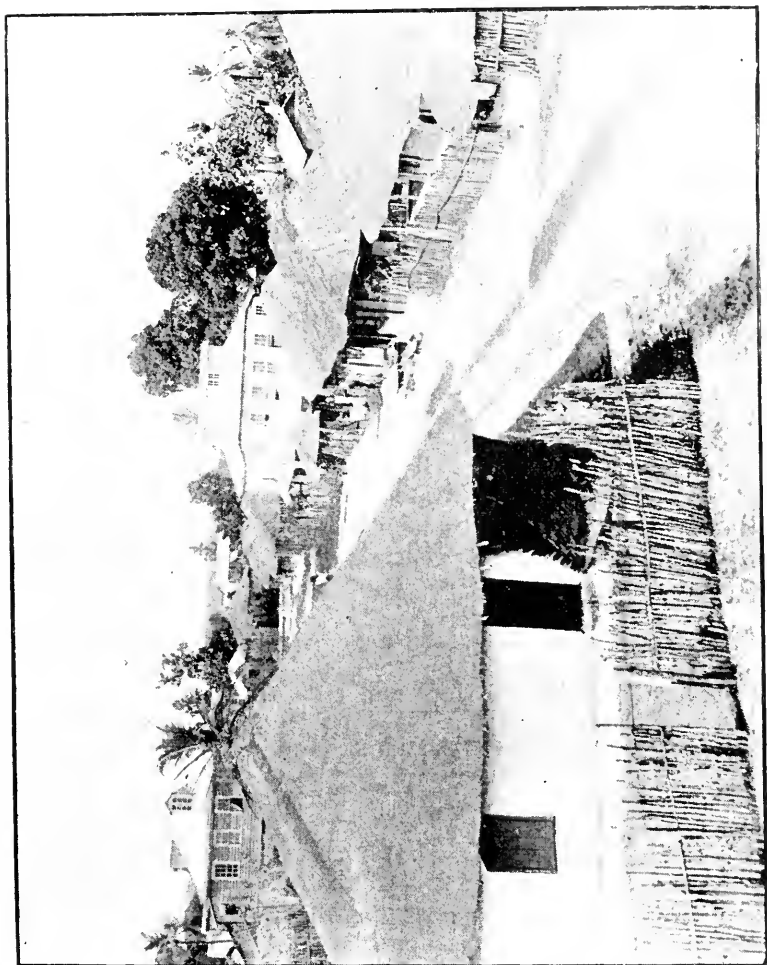
This imaginary line, as far as we can gather, practically includes the entire area at present occupied by the Mendies, and forms an imperfect square enclosing about 10,000 square miles of territory. From Senahû west to Kare-Lahû east will be about 150 miles as the crow flies, and from Kerriyemma north to Mano Saligah south will be an equal distance.

What detailed geographical information we have of this particular locality we owe largely to the notes taken during the recent punitive expedition, which the late Colonel Ellis led against the Sofas. Since then, the present governor, Colonel Cardew, has thrice visited the Hinterland, and careful observations have been taken. For this purpose he was accompanied on the first occasion by Mr. J. T. Aldridge, on the second by Capt. Compton, and on the third, just completed, by Major Grant, R.E., said to be one of the best observers in the army. These results (except the third journey), together with the notes of various commissioners and other travellers, have been incorporated as a zincographed map, hastily put together by the War Office for the use of the recent Anglo-French Delimitation Commission. This is a most interesting map, though it contains many obvious contradictions. Still, it is significant of the labour being expended upon the investigation, and we are confident that such activity will at no remote date issue in an accurate, harmonious, and detailed map of the entire protectorate.

Originally the Mendies appear to have occupied the country to the east of the Shewa River, including, I am inclined to believe, the Gigi (Kissi) country, as far south as the Behwa, and to the north including Konno (?). But they have been steadily pressing west toward the sea for many years, and have long ago overflowed their natural boundaries. Senahû is only 70 miles from Freetown, while the constantly-advancing wave

of Mendi influence has already practically inundated the land of the Sherbros.

These Sherbros formerly held sway over a considerable portion of territory, but were constantly embroiled in petty local wars. The appearance of Mendies in any considerable numbers



3.—A STREET IN BONTHE, SHERBRO.

seems traceable to their being hired in the first instance to fight the battles of these people. Now the Sherbros are rudely awakened to the Nemesis. The land the Mendies were hired to conquer they have stayed to possess. The various districts behind the Sherbro Delta were long a distraction to the Sierra

Leone Government, and several expeditions and treaties have been needed to establish anything like respect for law and order. The Ma Bantas, Sherbro, and others are now practically disposed of. The Sherbro are comparatively few in number, and their language is dying out. In a few years more the Mendies will have achieved a quiet and bloodless conquest of the whole district between Mano Salijah and the Bompeh River.

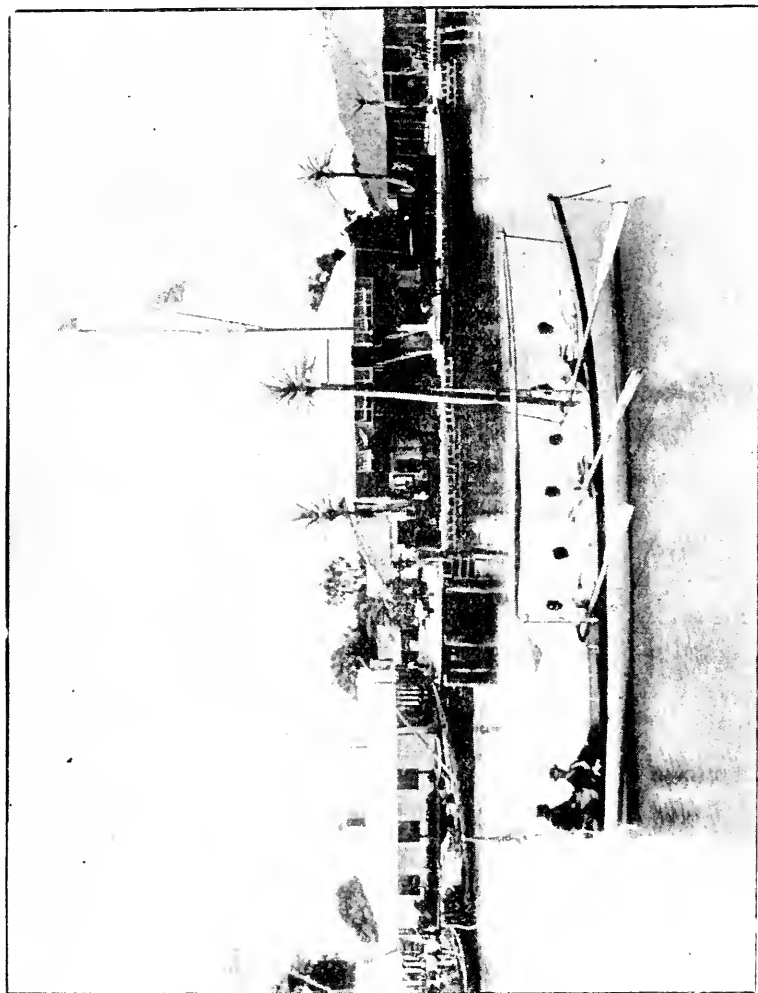
There are two entrances into the Mendi country; the northern door leads along the overland route from Freetown, through Senahû and Mangehu, where the roads focus from the south and east; but the great main entrance is through the western gate at the Sherbro Delta, where the many rivers which meet form natural highways into the heart of the country.

As far as the coastline is concerned, it is flat and uninteresting from the Ribbie, which drains the southern side of British Quiah right along to the Liberian boundary; it is, in fact, a continuous low mud level in which the mangrove flourishes abundantly—a monotonous line broken only here and there by a few giant cotton trees marking scattered native towns, or the exposed river banks, which swarm with birds when the tide is low.

The approach to Sherbro is most difficult to navigate, being embarrassed by numerous banks which have an unpleasant way of changing their bearings, and bewildering inexperienced captains with their little vagaries. There has recently been a Government survey, and an attempt to buoy the various channels, and record the depths, but the conditions are such that it is only likely to be of use for a comparatively limited period. With the cross currents swinging north and south behind the Sherbro Island, and the tremendous deposits of mud and sand continually being brought down the numerous rivers which empty themselves into the delta, constant and rapid changes are sure to occur. Indeed they are now so evidently in process as to threaten at no remote date to strand the rich trade of a fertile district, unless some engineering genius is called in, who with the sesame of science will open the delta gates afresh.

Beyond the flat area, which appears characteristic of the greater portion of the African coastline, the land rises into a most picturesque and hilly country. At Senahû, which is not more than 25 miles east of the sea, the land is distinctly above the level of the British Quiah, while immediately beyond that, from Kogbottima to the Tia River, the land is hilly, well-wooded, and abundantly watered. Beyond the Tia, after leaving Mano-Kwé, there is a considerable belt of flat country, containing numerous clay beds, and covered with scrubby bush and zanna grass. At Jammah the plain turns somewhat

abruptly to the south, and the hilly land is again before us in the east. There are no mountains of imposing altitude ; at the same time, in variety of form and charm of profile they are as delightful in their way as those of the English Lake District.



4.—A SHERBEG TRADING STATION.

I very well remember three impressive pictures. One was a view from Bandee, a town on an elevation east of Jammah, from which could be obtained a very expansive view north, east, and south ; another was beyond the banks of the Sehwa, where, on an ideal site, a new town was being built by some of

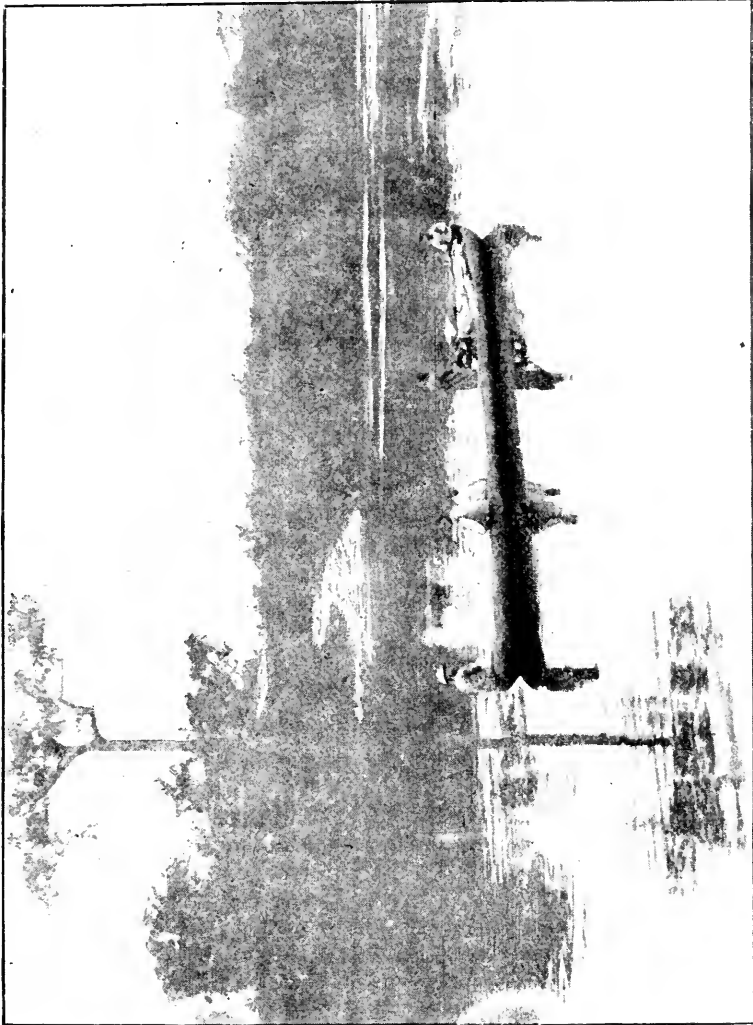
N'yagwah's people; but the third was *most* impressive, being more comprehensive than either of the others. It was from the ridge of the Bongé Hill, where the great road to the interior cuts its brow. This hill is much higher than any neighbouring land, and at a point we crossed must be ten or twelve hundred feet. We could trace the land as it fell away in a succession of terraces to the low area of the Ficondo grass fields, and then as it rose again in a range of steppes that climbed into the grey haze of the distance. The natives who happened to be with me at the time were not sufficiently acquainted with the country to give any satisfactory detailed information as to names; but I noticed one or two most remarkable groups of cones, that almost at first conveyed to the mind the idea that they were colossal castles, while others rising sharply out of their surroundings looked in profile like giant pyramids. We could see, too, the silver gleam of the Sehwa flowing south below the M'fway Rapids, the highest point reached by the boats of commerce, and below which the river's name is changed to the Big Būm.

We found the Lekwe Hills the most difficult in our travels, not so much for their height as for the stubborn opposition they offered to our carriers. It was pitiable to see the boys toiling up the steep paths, in many places over bare uneven granite, at other places where the loose laterite débris giving way under the pressure of their feet made it dangerous both for themselves and those behind them.

There are several rivers draining the Mendi area, some being waterways of considerable importance. The Bompeh on the north, navigable at all seasons to Rotufunk, Senahû, and Paitafoo with small craft; the Bargru, navigable to Mano Bargru; the Jong to Matro; the Big Būm to M'fway; the Kittim to Bumpehtuk in the dry season, and during the rains to Yonnie; the Sulima to a place called Widaroh; and the Mano or Bewha, to Gambia.

Of these the Big Būm undoubtedly exceeds in size and importance all the others. It is said to rise far away in Koranko, and is first known as the Bafin, then as the Sehwa, afterwards as the Būm, and from the bar-mouth, where the waters are joined by those of the Kittim down to the delta, it is called the Būm-Kittim. From the bar-mouth, the junction of these rivers, to Ronteh is a distance of about 40 miles, and at all seasons there is an abundance of water; but beyond the bar-mouth, where the Būm takes a great sweep round to the north, and the course of the Kittim falls away to the south, both rivers are, one may fairly say, at all times difficult to navigate. In the "rains" the waters are so swift that certain points can only be passed by warping, while in the "dries" they shallow so quickly, and are so full of bewildering sandbanks, as to reduce progress to the

slowest and most wearisome thing. But even the sandbanks are not all. There are a number of shallow rapids, low terraces over which the water falls with such swiftness as to make



9.—CROSSING THE TIA AT MANG-KWÉ.

rowing a tremendous strain, even to Mendi boatmen, who can do their twenty-four hours straight ahead at the rowlocks.

During the rains the Big Būm increases greatly in volume, giving an added depth of ten to thirteen feet, and a current

that is too swift to be comfortable when sweeping around the sharp bends of its serpentine course. Apart from what may be brought down from the upper reaches of the river, the silting up and the broad sand bars may be accounted for quite easily by the nature of the flat land through which the river flows. A top soil containing a considerable percentage of sand, and lying mostly on beds of grey clay, offers no important resistance to the unbroken flow of so great a pressure of water.

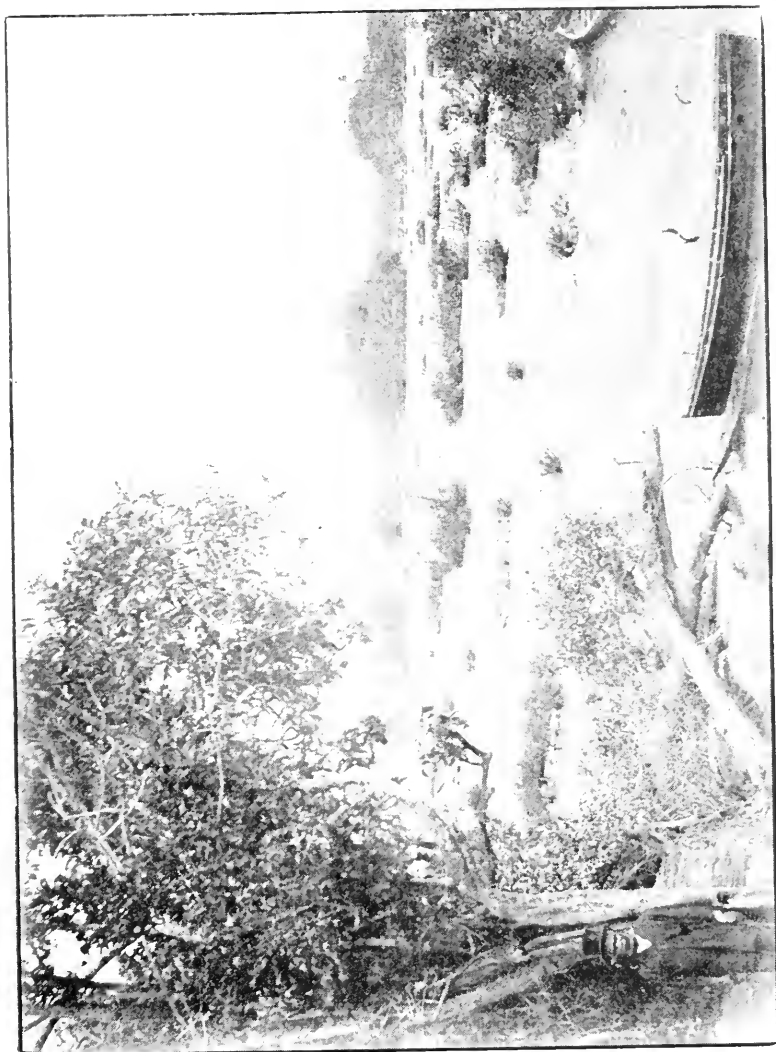
But in spite of all these difficulties commerce keeps an unwearied fleet upon these rivers, and night and day the boats are passing to and fro, and quaint Mendi songs that sound almost weird in the darkness measure their time to the click of the rowlocks, which bring down the produce of the country to the trading stations of the white man.

There are plenty of diversions on the river—abundance of wild fowl, notably some splendid duck shooting. There is good fishing, too, and though one is in danger of getting a shock from a certain electric member of the finnies, if he has the joy of hauling a good quamoose, that will be a sufficient compensation. From Bamine to Whymah, in the grass region, mosquitoes also are in great evidence—they literally make the night a torture with their hideous attentions. They are not like the pretty, aerial, fairy creatures we had in Freetown, who, like the Sirens, beguiled us to our fate with songs! These river mosquitoes are brown monsters, which fly in legions, and fall fiercely to the attack with a triumphant whirr, as if conscious of our utter helplessness. We discovered, when it was practically too late to be of any material benefit, that the people of a certain town in this region claimed the desirable accomplishment of being able, for a sufficient bribe in tobacco, to “tie up the mouths” of these little pests!

On our first journey up we took five days to reach M'fway. We had observed here and there increasing signs of rocks jutting out in unexpected places, called by the natives “devil holes,” but it was not till we reached M'fway that we found a place where the devils had apparently had it all their own way, and had thrown across the river a cataract which effectually defied further navigation. These rapids are very interesting, but having been fortunate enough to secure a fair photo, *that* may be taken in preference to any attempted description of mine. About 25 miles further up the river there is another interesting cataract, at a place called Cassamah. This I have not seen, but after a heavy rain and with favourable wind I have heard it “talk” at Tikonko, a distance of not less than six miles away.

As to the productions of this area, I am of opinion that we have hardly yet commenced to draw upon them. In the flat lands we have broad, rich belts of oil palms, among the

hills the kola, in the forests the rubber vines, camwood, gums, calabar beans, and indigo; while in the cultivated lands, which are rapidly increasing every year, we have



5.—THE MUFWAY RAPIDS ON THE BIG BUM.

maize, cotton, benniseed, &c. There is unmistakable wealth in the country, but the difficulties of transit have been hitherto so great that it has been impossible to bring but a small portion of it to the coast.

I am delighted to find that Governor Cardew, after thorough investigation, is convinced that the projected Sierra Leone Railway should be laid in this direction rather than to Bunban, as was first suggested. There can be no question as to the richer resources and greater fertility of the southern region of the Sierra Leone Hinterland. Up to the present every bushel of palm kernels we have had from the country has been brought to the riverain towns by slave labour. It is only a question of time, and our presence in the country, then slavery will practically disappear, and we shall be dependent upon such means of transit as we ourselves can institute and sustain. I should like to urge, therefore, upon those who have any interest in the development of this colony, to use their influence in expediting the completion of the proposed railway to the interior. I would not urge this simply on the ground of getting out of the country all we possibly can; I am of opinion that when we have properly understood the situation, there will be an investment of British capital for the further enrichment of the country, *and the betterment of the people*. The grasslands may be made a home for cattle herds; the bush may be converted into coffee orchards; cotton and rice raising may also be turned to profitable account. We who have undertaken to divert them from the cruelties of war and slavery, and assumed large responsibilities in relation to their country, cannot discharge our obligation to these people without to some extent teaching them to use mind and heart and body in the nobler occupations of peace.

But let me now attempt to describe these people. In physical characteristics they are a fine race. The people of the hills are fairly tall, muscular, and well developed; those of the low regions are somewhat shorter, but do not lack muscle. The Gallinas, however, have not so prominently marked the coarser elements of the Mendi physique. They are more akin to the Gigi, having smaller hands and feet, and more regular features. The Mendi is quite as muscular as the Timanee, and has rather the advantage of him in height. They are not so tall as the Mandingos or the Soosoos, but they are many points ahead of the Limbas. The men, on the whole, are much better clad than the women. The lower Mendies do not appear to have so great a taste for fancy hair-dressing, but in the Bambara country the men displayed heads without any manner of covering except their own crisp wool, cut and shaved into all kinds of fantastic scollops and dicees. In some instances considerable imagination was manifest in the designing, and certainly just as much skill and patience in execution, particularly when it is remembered that the instrument by which it is effected is an ordinary native-made knife. Some of the more important men affect Islam to the extent of shaving

their heads during the great feast, but it is probable that other sufficient reasons for so doing could be found, particularly in the hotter months of the year!

The women are on the average I should say quite two inches shorter than the men, and except for being rather stout for their height, have a well-proportioned physique. Their early training promotes a quick maturity. They pride themselves very much on the development of their bust, and the shapeliness of their limbs, and both their vanity and the custom of the country provides that the young women fresh from the Bundo bush may parade their physical charms in the most public places, clad only in beads, trinkets, and the smallest loin cloth that heathen modesty can suggest. From girlhood to marriage the free born seem to have a very good time; they are well fed and cared for, and many of them turn out fairly handsome in form, though often with very coarse and sensual features. Their best days are before marriage, after which the majority of them lose their physical attractions, becoming in a few years prematurely haggard and old. I remember N'yagwah, chief of Panguma, was daily accompanied wherever he went with a bevy of his young wives in attendance. They were the pick of the youth and beauty of his country, and some of them to great beauty of shape added considerable regularity and charm of countenance. Powdering and decorating their brows with coloured clays I observed was quite a fine art in that part of the country, and it was no uncommon thing to see little groups of the women crouching under the shadow of the eaves, rendering mutual service to each other's vanity.

In moral temper and character these Mendies combine various elements. They have long been known as a fierce, brutal, and war-loving people, and would, in all probability, quickly return again to the exercise of these qualities if British influence were withdrawn from their country. But they are not simply a brutal people by any means. Those who think that the African in his native bush is simply a kind of human brute, and nothing more, have made a mistake, the folly of which is only matched by its utter absurdity. There are extremely gross and revolting phases of their life and character, it is true, but in contrast to that you will find many things that are quite idyllic and patriarchal in simplicity and attractiveness. I met people in the country who were repulsive in their condition, and despicable in themselves; but I met others who in demeanour, presence, and character called up in my mind pictures I had seen of Old Testament times. Some were suspicious, but this attitude they invariably abandoned when they understood the nature of our visit. Sometimes we had to combat subtlety, but that is not strange when you recall that the white man has not always come to the African as a helper and friend.

We found some hot-headed and daring—we found others timid and cowardly. Some gave us shelter grudgingly, while others welcomed us with warmest hospitality. From some we were thankful to escape without conflict, others parted with us regretfully, giving us men to carry our baggage. It is impossible to forget how utterly in some respects they are degraded, but in spite of their heathenism they may be spoken of as a kindly and hospitable people. Given a perfect confidence is established between us, they are sure to develop qualities which will make them loyal and desirable allies.

I have noticed with regret that in speaking on the question of work, Governor Cardew has joined the enemy, and is inclined to regard the Mendies as lazy. This is the universal creed in relation to the African, and in any sense in which it may be true of other tribes applies also to this one, but it certainly is not true in an unqualified sense. It would be vain to claim for him that he loves work purely and simply for its own sake, or for the recreative delight of the strain it imposes on him. The persons for whom that can be claimed are in a conspicuous minority the wide world over. As a matter of fact, those who *do* work, work very hard, though there are many indolent ones who eat the honey the workers store. But I have an impression that Africa, dark as it is, is not the only country in which a life of indolence and ease is regarded as the proper thing for those who are sufficiently fortunate to attain to it! There are reasons for African indolence, and these, except in so far as they are climatic, will pass away under the new conditions of the African's future. In any such cases as they do not, the people will be stamped out; nothing can save them. The currents of the world's life are turning towards Africa in a way Africa cannot resist; the African who wants to survive this *must work*; and for those who *will* and *can*, God has given a future that no man can take from them. Lift the mists and let the Mendi see the great outside world; create new wants by showing him how low he has fallen in the scale; give him a reasonable reward for his industry; save him from the avarice of the strong, and give him security that he may peacefully enjoy the fruit of his labour; give him these things, and sufficient time: snap for him the fetters which bind his soul to the blind darkness of his fetishism; loose the *man* from the foul grave-clothes of his dead past, wake him from his sleep of centuries, and you will find him a being capable of taking rank with any of his fellows, indeed, scarcely recognisable as the outcast a cynical fiction has pictured him.

The chief food stuffs used by the Mendies are rice, cassada, cocoa, maize, pumpkins, and guinea corn; plantains, bananas, limes and oranges are to be had, but not in any considerable quantity. Palm oil and the oil of the ground nut are used for

cooking. Those who live near the big rivers have abundance of fresh fish, some of which are very fine. People of the inland towns and villages have mostly to be content with very small minnows, or a queer, offensive little creature they call a "jumping fish," known all through the country and found in the muddy banks of almost any little stream.

Cattle are scarce, and not much used for food; but sheep, goats, and fowls are in moderate supply. The Mendi, however, has a much wider range in his larder than this. He has the bush-cow, the wild hog, bush deer, water deer, fratumba, down the whole range of creation to rats, snakes, and locusts!

Of course, rice is the chosen food; cassada is the food of the poor and the slave. The free-born will scarcely eat cassada if they can get rice, and to like cassada is taken as a sign of ill-breeding, it being regarded as a choice sneer for an enemy to tell him that he "eats cassada like a slave."

Having made some reference to the subject, it may be interesting if in this connection I give a brief account of their fishing methods. In the larger rivers the fishing is done by men and boys all stark naked. I was very much interested in watching the fishermen of the Big Būm River. Companies fish with stop nets in the shallow water, forming a semicircle and beating the fish into the snare. Individuals, fishing alone, take the deep waters by the banks, where they dive and tickle the tree roots, driving the fish into a net placed down the stream ready for the purpose. In fishing at night, some of them operate from a canoe with bait and line; but there is another method which appeared to me quite as popular for the fun as for the fish. Along the edges of the numerous sand banks certain fish, during the day, make themselves resting places and haunts in the warm shallows. I have watched them at this interesting work, and when completed there appears a round, even, saucer-shaped dent in the sand, varying in size from six to twenty inches in diameter, according to the size of the fish, with just a narrow channel on the side leading to the deep and safe water. At night the fish return here to sleep, and the natives capture them by rushing upon their resting places with flaring torches and a bewildering noise. A shout, a flare, crash goes the deft stick, and poor finny's fate is sealed. Another favourite way is to throw obstacles across small creeks or inlets; this is a sort of bamboo paling with a trapdoor which is open as the water flows and closes before it ebbs. This, of course, can only be used where the tidal influence is felt. There is a very unpleasant way to which they sometimes resort: a loose barrier is placed across the stream and some distance above a poisonous herb is thrown into the water; this stupifies the fish to such an extent that they drift helplessly along to the barrier where they are caught and killed.

The women also fish, but they confine themselves to the smaller rivers and streams. They entirely divest themselves of their clothing, and, provided with a stout hoop net, will go neck deep into the water if necessary. One holds the net into position while another drives the fish. Very small streams they often dam up in sections, afterwards dipping the water out and picking up the stranded fish.

I am sometimes asked questions relating to the morals of the Mendies, which I find it difficult to answer, because the whole thing depends upon the standard by which you measure them. Judge them by Christian morals, and they have very little indeed that will answer to its standards. But if judged *by their own lights* it will be found that there are good and bad among them, though the good are in a very deplorable minority. Sexual infidelity is the first sin of heathenism, and in this respect the Mendies are no better than their neighbours. They have the moral sense, and have made a show of it in the form of laws and usages, *but everything has its price*, and there is no real earnestness or sincerity in the way the law is enforced. Among people who have a sufficiently strong tribal life, and a certain amount of moral appreciation for law, things do not sink to such degrading depths, but the Mendies have no corporate tribal life; they are made up of independent and decentralised groups, and so lack the corporate strength and unity which are essential for the enforcement of any high form of moral life and government. It is really funny to hear every chief one meets claim that the whole country belongs to him, when as a matter of fact his authority is only recognised on a very limited area. If the Mendies were a united people to-day, as it may be presumed they once were, they would probably manifest moral, social, and military qualities of a much higher order than those they now appear to possess. The moral decadence of the people as a whole is to some extent at least attributable to the weakness which is born of tribal disintegration.

The Mendies are distinguished by three great family terms of Gallinas, Gba Mendies, and Kaw Mendies. The Gallinas are nearest the coast, and speak the purest form of the language, and are said to have invented written signs of their own. Gba Mendies occupy the middle country, and the Kaw Mendies the hilly country remote from the sea. But these distinctions do not appear to stand for much; the real cue to the present division comes from territory claimed by a given king and his subordinate headmen. As, for instance: Tikonko Mendi applies to any one who comes from any town or village over which Macavoreh, the chief of Tikonko, exercises jurisdiction. In the same manner a Bumpoh Mendi might hail from any

part over which the late Bogbuavē held rule. Yet, though it is only twelve miles from Tikonko to Bumpeh, and the people have a common origin and language, the deadliest feuds existed between them until quite recently. Perhaps



1C.—THE BO ROAD NEAR TIKONKO.

not with an equal bitterness, yet still with an effectual estrangement, the whole country is broken up into fragments, and what ought to be a strong tribal life is split up into comparatively impotent tribal cliques.

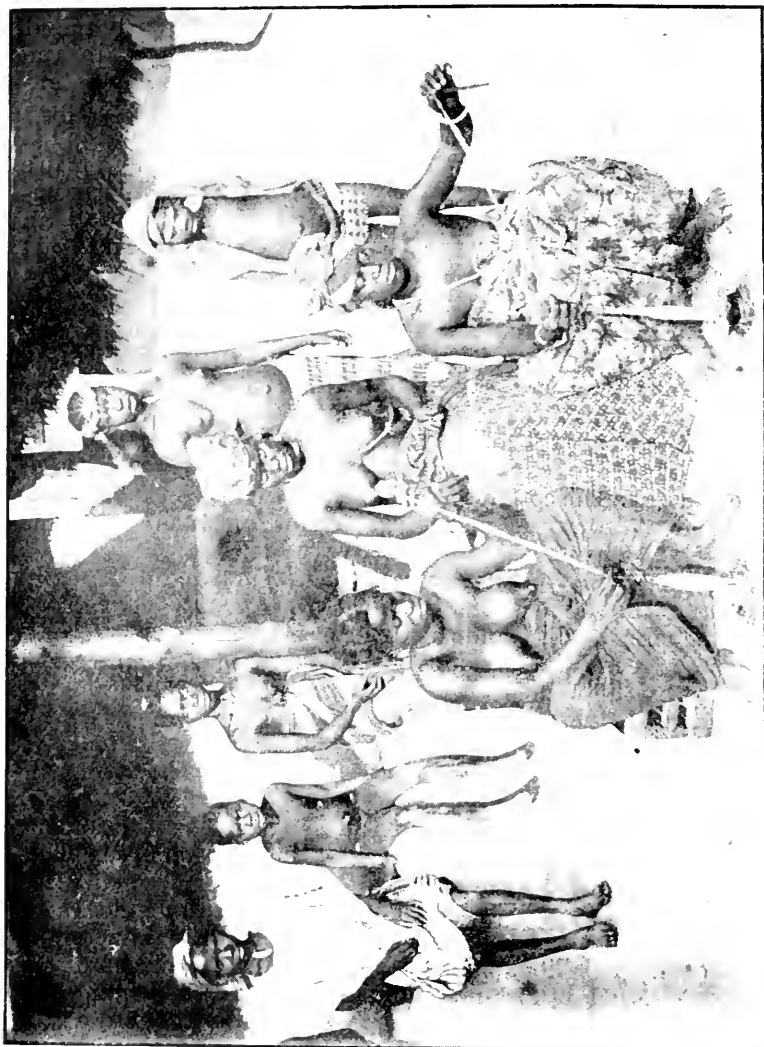
Agriculture is now the chief occupation of the people. In the old war days planting was not so scrupulously attended to—raiding and plunder formed the chief fountain of subsistence for all who could take part therein. Now, however, things are being changed, and land-tillage is occupying increasing attention. The range of cultivated articles is quite limited: rice, cassada, pumpkin, maize, coos-coos, cocoa, cotton, and a few herbs. The work is accomplished chiefly by slave labour, the men doing the brushing and burning, the women and children attending to the planting and bird-scaring. The rice harvest is always a time of great rejoicing. It is cut off short with a knife and the straw left standing. Some of the professional harvesters are exceedingly smart at their work, and are said to owe their alacrity to the possession of superhuman aid in the form of “medicines” or charms. The methods of their farming are astonishingly aboriginal and crude. They have only three implements of the most elemental type: the cutlass (*kpāto*), like a primitive hedger’s hook; the axe (*komī*), much like a stonemason’s chisel only broader at the blade end; and the hoe (*kālī*), the shape of a tea-saucer, and provided with a tag to fit into the handle, which is about eighteen inches long. With these three crude implements they raise all such crops as they require for food. As to the land, they have the most extravagant and wanton way of dealing with it—a method which only requires a limited time to utterly denude the country of its virgin forests. Every planting season sees large areas of bush and portions of old forest put to the fire; and it is pitiable in some places to behold the charred trunks of giant and valuable trees standing as gaunt and unsightly proofs of the crass ignorance of the people. In these forests are choice woods, rubber-vines, calabar beans, gums, &c., but for lack of knowledge these treasures have been sacrificed in fire, a holocaust which every farming season for centuries has consumed great wealth, in conflagrations which make the night awful with the glare and flame which would do justice to the yawning mouth of Hades.

Brushing the underwood, felling the bigger trees, firing the prone forest, planting in a confused wilderness of charred sticks, harvesting when the rains subside, abandonment for a new clearing after two years: this is the natural history of Mendi farming. Cattle raising does not appear to have dawned upon the Mendi mind. Here and there, one may find a few in the possession of stronger chiefs, but the Mendi is in no sense a herdsman. Such cattle as are found belong almost exclusively to the chiefs, and are regarded more as an ostentatious evidence of wealth than a potential food supply for the tribe. Fresh beef is a rare phenomenon—the cattle being reserved to give magnificence to tribal feasts, red letter days, visits of English officials,

and the like. Many of the cows stand to represent the absence of men and women from the tribe; a cow being a favourite exchange for a slave. Small goats and hairy sheep are fairly numerous, and in the majority of instances these form the "blood present" in the extension of hospitality to important visitors. Among the poorer folk, fowls are numerous raised and are much esteemed. They fill no small place in the currency of daily hospitality, fines, presents, etc. Eggs are seldom eaten; it is rank heresy to attempt to purchase them for cooking. An egg to-day is a chicken to-morrow, and a chicken to-morrow is a fowl the next day; a fowl in a man's hand may appease the anger of his chief, or buy the interpretation of mystery from the medicine man; *ergo*, he who eats an egg does wanton injury to the possibilities of his own survival! It is pleasant to see their care of the chickens as they carry them in bamboo cages to the farms in the morning for better feeding through the day, and bring them back to town again for greater security at night; and when darkness comes down they are allotted their own share in the one room which gives general accommodation to the family.

Turning from this to handicrafts, we find the people have a knowledge of cotton raising, spinning, and weaving, together with dyeing. The cotton seed is apparently planted at the same time and place as the rice, and so comes on as an after crop when the rice has been gathered. Very little attention is given to it, and when ripe it is roughly collected and tied up in bundles. The staple is inferior and short. There are two kinds, one producing a white and the other a pale brown. The separation of the seed is largely done by the children, the carding and spinning by the women. The carding is done by springing the cotton on the tight strap of a small bow, the strap being drawn between the finger and thumb as if for shooting an arrow. The uncarded cotton, being twisted round the strap, is straightened out by the repeated process of springing the bow. The spinning is done with rounded pieces of hard wood about eight inches long, and the size of an ordinary penholder. This is weighted about an inch from the bottom with a small piece of soap-stone. It is now a sort of tee-to-tum with an elongated pivot; and this is the sole instrument used in the production of the thread. It is kept spinning with the finger and thumb on a shell, or some other smooth cavity, to prevent it from wandering, and a small piece of beeswax is added to the top to grip the thread being made. Provided with a low seat, the operator arranges this simple instrument conveniently on the right side, while the carded cotton is loosely held in the left hand; with a swift and dexterous spin the thread is drawn out and started, at the same time being rapidly and with astonishing evenness regulated with the fingers to the required size. Dyeing is also

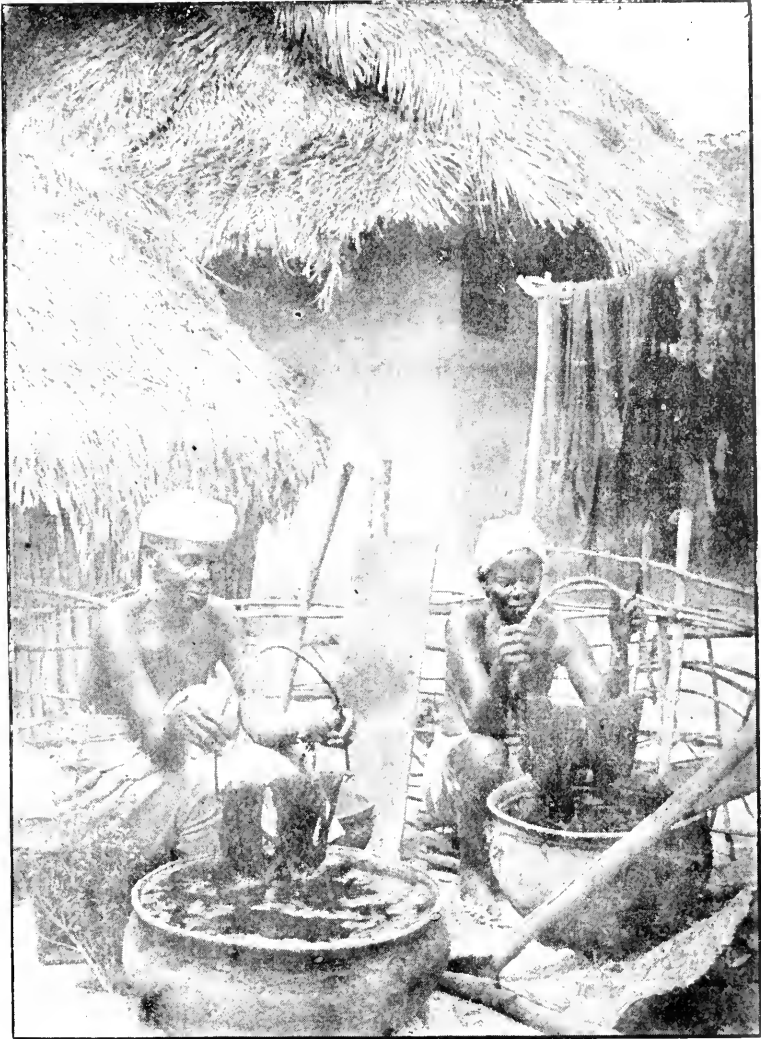
the work of the women, and is chiefly done in the yarn, or "thread," as they call it. The dyes are purely vegetable, and they are only able to produce a very limited range of colours.



6. — MESSE WOMEN SPINNING AND CARDING.

The pure white, undyed; the creamy white, from inferior cotton, also undyed; *bajjie*, a good yellow; *kaffey*, a very passable brown; *fandee lay*, a most commendable indigo; and *jin mani bai*, a watery sky blue. Red is supplied by the purchase of red

wool caps from traders. These are frayed out and mostly worked into the finished cloth with the needle. They have no red of their own, and have never learned to utilise for the



7.—MENDI WOMEN DYEING.

purpose the camwood so common in their own forests. With one or two exceptions the dyes are used cold. Some of the old Kaw-Mendi women are very skilful in setting a fresh dye-pot,

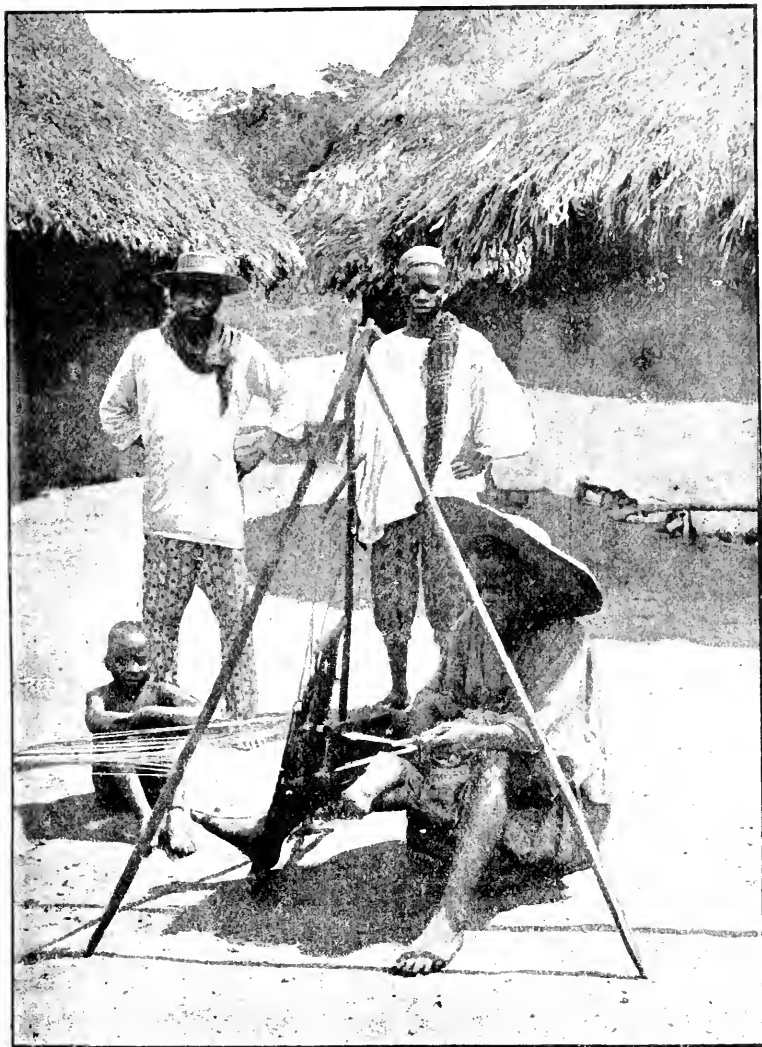
or in restoring it when "sick." Their method in dyeing is to saturate the thread and dry it, repeating the operation until the required depth of colour is obtained. *Bajjie* is obtained from the bark of a tree very common in the country (*craterispermum laurinum*?), indigo from the tree (*indigofera anil*?) which grows wild in the bush. There is a small and valuable blue, which the Mendies call "black" to indicate the intensity of its power. This (*lonchocarpus cyanescens*?) is much esteemed and is cultivated in the early rains on little cleared patches just outside the town walls. It grows to a shrub about 3ft. high, and might almost be taken for a young acacia. The young leaves and twigs are gathered, and are crushed under foot, or in a mortar, dried, and laid away until required.

Nothing can be more primitive than the Mendi loom. It hangs under a slender tripod of sticks, like a gypsy's kettle, and the motive power is applied in the simplest way by two treadles worked by the right foot. The shuttle is a stick about nine inches long, and is passed to and fro as the treading separates the warp. The accompanying photo. may be taken in lieu of a longer explanation, and will probably convey a clearer impression. The cloth is woven in strips, which vary from six to ten inches wide. It is then cut to suit the length of cloth required, and the strips are sewn together till the requisite width is obtained. In weaving designs they sometimes count, but oftener the pattern is gauged with a notched stick.

Fibre-work must not be forgotten in speaking of the handicrafts of the Mendies. The country is very rich in fibres, some of which, the bamboo palm chiefly, the natives know how to convert to their own uses. In this way they make mats, ropes, twines, different kinds of fishing nets, and most useful hammocks. I do not know what the Mendi country *would* be like without hammocks. What would the chiefs and the indolent do without the numerous hammocks with which every decent "barrie" is furnished? In these they suspend themselves, luxuriating the whole day through—smoking, drinking palm-wine, hearing palavers, or imposing fines. They know no more haste than eternity, and are no more flurried than if the world had not started yet!

Wood-working does not flourish to any considerable extent, but I could produce some interesting examples of the Mendi's capacity for working in iron. The smith's shop is invariably outside the town, on account of the danger from his fire. The majority of them appear to be itinerants, settling only for brief periods at given places. Iron is found in considerable quantities in many places among the hills, but the quaint little blast-furnaces are now no longer in much requisition. The introduction of English iron has superseded the productions of the native smelter. Hoop-irons and reeds, specially in the farming season,

may be found in every caravan with its face toward the interior. Farm tools, clumsy needles, arrowheads, knives, jungahs, etc., etc., are made by these smiths, in addition to which some of



8.—A MENDI LOOM

them have the gifts of the brazier as well. With a rough hammer, a stone for an anvil, a charcoal fire (certain trees charred for the purpose), and a skilfully constructed dual

bellows, they can produce some very commendable work. I have noticed, however, that they do not appear to be familiar with hardening processes. Their cutlass, for instance, is a very limp and yielding affair; yet there can be no question but that, in their own hands, it is better for forest clearing than the best English steel. We have seen them at work, side by side, in the Mendi bush, and the best English axes made a sorry figure beside the native-made tools, which, being tough rather than hard, were not so readily damaged by the iron-woods upon which they were used.

A word on clay-working will about complete the list of their handicrafts; their talents in this direction are almost exclusively exercised in pot-making. They range in size from the six gallon dye-pots down to those which will only contain a pint. The smaller sizes are used for cooking soup, the next for boiling cassada or rice, while the next larger are devoted to the storage of water in the house. To this latter use they are eminently adapted, keeping the water delightfully cool. They are found in nearly every dwelling, with a small gourd floating on the top of the water—a convenient arrangement for thirsty wayfarers in a hot country. The most curious thing about this clay working is that they do not appear to be acquainted with anything that can be dignified by the name of tool. The clay is of a fine quality and prepared for use by beating with a flat stick, and treading with the feet; having been mixed to the proper consistency, it is rolled into worm-like lengths varying in diameter according to the size of the proposed pot. The clay-worms are then coiled round and round until the bottom is of the required size. The clay is pressed into cohesion with the fingers, then the body of the vessel is slowly built up in the same way; afterwards the interstices are carefully filled up within and without, for this purpose a small smoothing stick being used. Finally the surface is finished off with a wash of finest clay. These pots are literally *built*; the Mendies do not appear to have any knowledge whatever of the wheel. To fit them for use they are first slowly evaporated in a cool place, being gradually advanced till they can bear exposure to the tropical sun. What remains, after the sun has done its work, is completed by the application of wood fires; they have nothing equivalent to a kiln, and are unacquainted with the art of glazing.

It will, perhaps, be interesting now if we turn to the consideration of some characteristic features of their social life, and first let me say that, in spite of certain darker phases, I was impressed with its general simplicity and freedom. Into whatever divisions society may be ranged, there were no very harsh lines of demarcation. The king is personally accessible to the poorest of his subjects; the dutiful slave has no fear in approaching his master; the young people have a fairly good

time; and the women enjoy greater liberty than among many other West African tribes. The laws regulating the social life are all traditional and oral, but they are well defined and clearly understood.

Marriage is ordered in the following way, the woman, in a few cases, being granted a limited right of refusal: The man seeking a damsel to wife makes the proposal to the parents either personally or by proxy; disparity of age does not in the remotest degree enter into the consideration. This preliminary venture is accompanied by a "kola" or present, which, near trading stations, usually consists of a piece of cotton goods, a bottle of gin, and a head of tobacco (four long leaves). The decision hangs on the acceptance or rejection of the "kola." If the parents take the present it implies their consent, and the suitor may take the woman to his home. But this may be purely a temporary arrangement; the regulation fee to "bind the marriage" is the present of "a head of money" (value about £3) to the family of the bride. This makes the marriage valid and legal, and prevents the after-interference of either parents or relatives. As a general rule the girls are very early allotted to their future husbands; in fact, this custom is carried to the extraordinary length of claiming the unborn child of a woman about to become a mother. In such cases, if it proves to be a girl, she is regarded from her birth as the wife of the man who has risked so much in being so "previous." In this case the man must cement the bargain with a periodic repetition of the "kola" until the girl is a sufficient age to be removed to his own house. There are, undoubtedly, love-matches among this people as among all others. I have often heard the young Romeo chanting aloud the charms of his Juliet, and making his clearing ring with the description of her beauty; but the conditions of life are such that all sentiment is very largely subordinated to considerations of a more mercenary and not so ideal a character. The young romancist in the farm may beat time with his hoe to his most sensuous ditty, and Juliet may pine for him while she rubs the cow dung on the barrie floor, but their tender yearning will be utterly disregarded if it be thought that in the family interest "my lady fair" should be wedded to another. Powerful chiefs have a practical monopoly of the youth and beauty of the country; in the turbulence and uncertainty of their life, the timid and poor have no surer way to bid for the protection of the strong chief than by spontaneously presenting to him the flower of the family to wife. There appears to be no regulation as to the number of wives a man shall possess; I was confidently informed that N'yagwah had four hundred!

The legal completion of the marriage hangs on the payment of the "present," but what may be called the ceremony is in

the native tongue, "the swearing." The country-fashion man is the high priest on this occasion, and on his most powerful medicines (fetish) the woman is required to "swear" or vow unwavering sexual fidelity to her husband, and she is forced to call unnameable vengeance to overtake her if she departs from her vow. No pledge whatever appears to be taken from the man. In cases where the young wife is found to be chaste, the husband is supposed to mark his appreciation of the fact with an additional present to the parents. The first wife takes rank over all the others and is called the "big wife," she is given considerable authority in some cases, and may adjudge little differences which arise among the members of the harem. Divorce seems only resorted to in extreme cases. Insubordination is punishable with flogging, while in such cases as that of a dissatisfied woman who escapes to her own family, the trouble is regarded as a "palaver" to be examined; when it is "talked" by the friends and adjusted, whichever may be found in the wrong, "begs" the other with a "kola"; if, however, the woman refuses to return to the man, and her friends uphold her in that course, the husband can reclaim the whole of his presents. This is a legal divorce, and the children are regarded as belonging to the father. If a man takes an aversion to his wife and wishes to be rid of her without specifying any charge, he sends her to her people with instructions to wait there till he comes to fetch her back. This he is careful not to do—delaying with many excuses until it is quite apparent that he has abandoned all further claim to her. This is the non-contentious method of divorce. Sexual infidelity, though punishable, is not regarded as sufficient ground for divorce. In such cases the wife may be flogged and sent away, but the intercession of her people, and a present, will readily restore conjugal relations. The husband may, however, sue for damages from the man who has led his spouse astray. The fines used to be very heavy, and if unable to pay, the man might be claimed as a slave unless his friends would redeem him. Hundreds of slaves have been made in that way, or more accurately *trapped*, for that is what it literally amounts to. This is called "woman palaver" in the Mendi country, and in the days of their heathen isolation was ranked among the social institutions of the *first importance*. In a case which happened quite recently one of our native ministers had to interfere where a man was threatening to kill one of his wives who had been unfaithful. The singular thing about it was that the excess of the man's rage was not kindled by the adultery, but by the duplicity of the woman in attempting to defraud him of the proceeds. He refused to be pacified, and his righteous anger raged on till appeased with a gift. This would be unimportant if unusual; such things, however, are of common occurrence. It fills one with sadness to think how low

a people must have fallen of whom such things can be written, and how slow and tedious will be the climb to the higher region of nobler moral ideals.

Concubinage is practised, and appears to be of a most elastic and accommodating character. It is practically marriage in the first degree, *i.e.*, with the "kola"; but the stranger and sojourner may enter into it with the clear understanding that it is *pro tem.*, no permanent responsibilities or obligations being involved. In this whole question they are accommodating to a most remarkable degree. I knew a case of a young woman whose fiancé went down to the Congo Railway, promising soon to return with his fortune and marry her. Meantime she was left in care of another young man, with whom she lived as his wife. The time had long expired when the fortune hunter should have returned, but he came not. After weary waiting, I suggested to the girl that she should either marry the *locum tenens*, or leave him and live in a proper way. She, however, preferred to continue the arrangement till her proper husband should come to claim her!

Under such conditions it is not surprising that there is only a very elemental form of *home life*. There is, without doubt, the home sentiment, but there is comparatively little in their surroundings likely to nourish it into strength. They attach themselves rather to the town than the hearth; they temporise and shift about so much that it is more a given locality they regard than a home spot, about which cling such memories as touch the deeps of our own hearts. There are family bonds, family affections, and family obligations; but what we should call home life is yet in its infancy among them.

What may be called the chief pleasures of the social circle are singing and dancing. They are passionately fond of both, and often sing and dance far into the moonlit nights. In fact, when mosquitoes are excessively numerous, they beat and dance the whole night through in the riverain towns. Once at Yoko's, and on another occasion at Gellihu, I heard some really charming native songs and choruses, which were kept up most of the night for our entertainment. These were rendered by about ten or a dozen girls, and there was more range, taste, and variety in these performances than I have ever heard elsewhere among them. Next to these, the boatmen's songs are very interesting: but for fervour, impulse, and go, one must hear the town songs when the day's work is done and the moon has risen. The people throw themselves into these noisy, rollicking performances with all their heart and soul. They are really more action-songs than anything else, for movement is an almost invariable accompaniment. It would be impossible for them to sing with any fervour without clapping hands, swaying the body, or beating the time of the tune with the foot. The

town dance is a public performance in which any one may join. An improvised solo is chanted, the chorus being taken up in responses after each line. The time is marked by loud clapping of the hands; the body is violently swayed as the perspiring, jubilant crowd circle round the musician. The accompanist is a drummer, who is sometimes assisted by a fellow who makes a rather musical jingle with short iron tubes. Mendi imagination has not got much beyond this in the way of inventing musical instruments. The spirit and zest of the dance practically rests with the drummer: if he flags the performers slow down, but when he quickens his beat to a rapid torrent of vibrations he thrills his savage companions to the wildest enthusiasm—then men and women utterly abandon themselves to the delirium of movement and song.

Among the social habits noticed, smoking, snuffing, palm wine drinking, and gambling may be mentioned. Tobacco is one of the chief articles of barter in the country—it is a recognised currency, the price of an article being stated as so much tobacco. For this purpose they use a trade (American) tobacco; but in some parts they cultivate it largely for themselves with considerable success. The whole population are devoted to the weed—the indulgence of the women being conspicuous. For snuffing purposes they have a decided preference for the imported article; this habit is practically confined to those who profess attachment to Islam. Like most other Africans, the Mendies are fond of rum and gin when it can be had, but the common drink of the country is palm wine. This is the sap drawn from the oil palm or the bamboo palm, and varies considerably in quality and flavour. The sweet kind, taken fresh in the morning, is a very pleasant and harmless drink; taken later in the day, when fermentation has set up, it is decidedly intoxicating. A considerable number of oil palms must be annually destroyed or damaged in procuring this, the only strong drink common to them. The people are greatly addicted to this habit, and large quantities of it are consumed. Gambling is a favourite pastime; the popular game is called "*Sigo*," and is played on a skin, with ivory tops. Four players are a set, and arrange themselves as if for whist, only seated on the ground. A goat's skin or square piece of cowhide is placed in the centre of the group, the space beneath the hide being carefully packed with banana leaves and stalks, so that the edges of the skin are raised and a hollow produced in the centre. Play begins by naming the stakes: the ivory tops are spun with the finger and thumb into the hollow of the hide, and the victor is the one whose top knocks those of his opponents off the skin. "*Wallie*" is another popular game, but it does not appear to be one over which they gamble.

Such institutions as slavery, polygamy, and the like are common to the Mendies as to most other African tribes. On these it may not be necessary to write beyond recording that "pledging" is very common among them. Those who would not feel competent to *sell* their own free-born relatives, may extricate themselves from debt by *pledging* them! This mild term, "*hele-hei*," has been invented to cover a multitude of sins, and from long usage has come to be regulated by a code of most interesting laws.

There are several organised societies among the Mendies; but being for the most part of a secret character, it is somewhat difficult to obtain reliable information concerning them. In the Porroh and the Leopard Societies males only are admitted, the Emoi and Bundo are reserved to the women. Each society has its respective fetish or medicine, and each its zealously-guarded meeting place in the heart of the forest. The fetish is the guardian spirit employed to prevent the intrusion of non-members, and, as the people are taught to hold these things in great dread, their meetings are quite secret and secure.

The "Leopard" is a dark and cruel society, whose presence and operations are kept a deadly secret. From the very character of its aims it is bound to carry the esoteric spirit to its utmost limits. The only outward tokens of its presence are the disappearance of its victims. For a long time its existence was even doubted, and its doings regarded as a grim fiction, but its vile reality can now no longer be denied. Whether it is simply an association of cannibals, or whether the victims are slaughtered chiefly on account of a certain portion of the intestines, said to have peculiar efficacy in the evil medicines and charms, it is difficult to say; it is, however, quite clear that murder is one of the chief aims. The Sierra Leone Government recently hanged two members of this fraternity on clearly proved charges of murder, and two more are now under arrest. But there is evidently some motive beside murder, and the cooking pots and remains found in their haunts clearly point to cannibalism. Imperri is its present stronghold, though it is not confined to that district. It takes its name from the fact that the victims are waylaid by persons dressed in leopard skins, and armed with iron claws.

The "Porroh" bears a strong family likeness to the secret organisations of other West African tribes, and it is possible they may all owe their origin to a common source. It is quite conceivable that it was originally founded for justifiable reasons; if so, it has outlived its primal uses, and its present condition may be taken as only another evidence of a general tribal decadence. There are indications which prove that this must once have been a very powerful inner political organisation, but, unfortunately, usages of a distinctly pernicious character have

gradually become the most conspicuous evidences of its survival. The membership consists of enrolled males of the tribe who have passed the various ceremonies, and are sworn to secrecy on the Porroh medicine. Full privileges are only accorded to adult males who have passed the preliminary degrees. Young men and boys are separately organised as probationers. Some considerable time may elapse between their noviciate and their re-entry as full Porroh men, and their entrance is marked by a change of name. The Porroh noviciate is a lucrative institution for the Lakkah, who has the right to found it almost anywhere he chooses. If a sufficient number of lads are not enrolled by their parents or owners (slaves are eligible), organised parties may seize and forcibly initiate them, protest and appeal being disregarded. Parents are required to feed their boys during the probation, and to pay to the Lakkah at its termination two "bars" of money (value from 4s. to 6s.) for each lad. The thieving scandal, for which the Porroh is notorious, is perhaps chiefly associated with the noviciate, though not by any means confined to it.

The adult society is a sort of privy council to the chief, and where the Porroh is strong, exercises a powerful political influence. In addition to the rulers, only Porroh men are recognised as having a voice in the affairs of the country.

The Porroh may allot the land to farmers; fix the date for gathering the fruit of the oil palm; plot war; fix the local price of kernels and trade labour; make laws; impose fines, etc., etc. The chief seems to be regarded, by reason of his rank, as the head of the Porroh; but the Devil (*porroh-yaffa*) and his assistant also appear to have great power. Where the Porroh is weak the privileges above-named fall to the chief; where strong, the Porroh becomes oppressive and arrogant.

The Porroh Devil is the bogey with which a superstitious dread of the society is enforced. The "Devil" is an individual disguised in the most hideous costume they can conceive of. The visit of the *Porroh-yaffa* (devil) is the signal for plundering. All women, children, and non-members must hide themselves in their houses, and woe to the unlucky mortal who is caught out. The Devil and his attendants give warning of their approach with horn-blowing and shouting, then swooping down upon the town may help themselves to the fowls, rice, bananas, or whatever they can find; but they may not take a fowl from the roost, nor may they take sheep, goats, or ducks. They smarten the wits of their novices by making it permissible to flog them if they are caught, so that by the time they are full Porroh men they are fairly efficient! Yet, though they may flog them as much as they like, they must mention no name, nor make any exposure—to do so may entail not only the loss of the stolen articles, but a heavy fine in addition. Sometimes

the *Porroh-yaffa* undertakes to close the road, when a toll is extorted from all passers "to open the way." The call to "sacrifice" is another favourite method of extortion. The individual who does not bring a gift to the mouth of the Porroh bush is a marked person in the community. The true Porroh man is, *par excellence*, the man to pick a quarrel, and the law practically ensures his making a profit out of it. The most trifling accidents are construed into serious offences against the sacred person of the Porroh man. For a non-member to throw water on him, or run against him, is "palaver" at once, and the greater the chance of gain the more serious is the offence. Porroh men may evade payment of debts by hiding themselves in the bush, providing the creditor is not also a member. Persons (not previously Porroh men) guilty of certain crimes may free themselves by rushing to the bush, becoming initiated, and changing their names.

The "Emoi" society I have only once come across; the priestess was a shrewd old woman, with a pair of keen shining eyes. As far as I can gather, this society has the medicine of the dead. It concerns itself about death and its causes. I witnessed at Tikonko a most interesting ceremony, a sort of investigation conducted by the old priestess. A little child had been accidentally strangled—that must of course be the work of a witch—that witch must be resident in some one—let the "ordeal" find the person out! This "ordeal" was quite an interesting and humane variation of the common African practice; it consisted of rice, with a soup of palm oil, and boiled fowl. The family and friends were seated round the child's grave, and the feast was shared among them. The "ordeal" element seemed to be provided in the curse of the old prophetess pronounced against the guilty party, as she doled out to the company their respective portions of the spread.

This suggests the whole question of Mendi death customs, a most interesting subject, but the space at my disposal does not permit my dealing with it here.

The "Bundo," like the Emoi, is a society for females. The woman in possession of the Bundo medicine is a very important person, it being one of the most enviable female distinctions. The "bush," where the Bundo girls are trained, is always sufficiently near to the town to give them security from molestation by enemies, and no male may enter into it on pain of being caught by the "Medicines." The full Bundo mostly goes through three stages, or periods of residence, under the care of the Bundo mother; these being completed, she is regarded as marriageable. The girls are taught singing and dancing, but the chief aim of the society is a sensuous physical culture too gross to be described. The end of the training is signalised by a ceremony called "Pulling Bundo," *i.e.*, withdrawing them from

the "bush." This is a time of great rejoicing and feasting. The girls, clad chiefly in trinkets and beads, parade the town, receiving the admiration of their friends, and evidently enjoying to the full the novelty of being on show. Some of them dance remarkably well, and their singing as they kneel on the ground is interesting, but in essence and aim it is an institution which could only find a place among a sensual and degraded people.

It remains only for me to touch upon the religious element in the life of the Mendies, and I must then bring my necessarily imperfect paper to a close. In the subjects already dealt with I have found it rather difficult to combine condensation with justice in attempting to estimate the character of the Mendies, but that difficulty is very much increased when I attempt to touch the subject of religion.

I call it the "religious element" in their life because that appears to adequately describe their religious status. Whether the present condition indicates a sort of sceptical declension from idolatry, or whether it signifies that they have outgrown it, I have not had opportunity to properly investigate. This much, however, is evident; they have no systematic idolatry; images are very seldom found; they have no tribal deities, and hardly any local ones worthy the name; they have no recognised priesthood. And yet to hint that they are destitute of religion would be as much a falsity as to land it beyond the degree justified by facts. After putting the most generous interpretation upon what one finds, it is not injustice to affirm that they have only the elements of religion—the primal and crude conceptions which indicate a people in their ethical infancy.

N'Gêwo is the word which stands to them for their idea of God; he resides "inside the belly of the sky," and has some indifferent interest in human affairs. Of his character and place in the universe they are ignorant, and evinced the greatest interest and surprise in the reading and explanation of the early chapters of Genesis. The belief in *N'gaffaisia* (spirits, ghosts, or devils) exercises a far greater influence upon their mind, life, and character. There is nothing to fear from *N'gêwo*, so he is disregarded; but the *N'gaffaisia* touch them at every point, and so are to be dreaded. This creed makes them exceedingly superstitious, and an easy prey to any who have the audacity to claim occult powers. They do not exhibit any interest in the beauties of Nature, but by its broad features they seem to be deeply impressed. To the aboriginal mind, sky, hills, forests, rivers, are full of wonders which are uninterpreted mysteries, and awe their spirits in a way they do not understand. "*N'gerra magbindia i'gê*," the darkened sky *talks*; the waterfalls *talk*; everything has its voice. The forest is peopled by persons beyond their ken; these are the spirits who stand

unrevealed, yet influencing for weal or woe the passing generations of men.

Though intangible and undiscovered, these spirits have recognised places to which propitiatory offerings may be brought. The silk cotton tree (*eriodendron anfractuosum*?) is greatly regarded for this reason. It is a magnificent tree of colossal proportions, the most conspicuous object in the forest, and from Senegal to the Niger is invested by the natives with attributes which command their reverence. There is a small ant which builds up a peculiar-shaped home from one to two feet high. This structure is mostly in the form of a huge mushroom, and composed of earth, having a black charred appearance. Wherever these ant-cones are found, offerings may be placed. They are often thatched and guarded in the farms, and sometimes where the town devil lives in the silk cotton tree the cone is removed, and placed between the giant roots of his dwelling, and the sacrificial honours are then shared between the two. Dangerous rapids on rivers, or curious out-crops of rock, being regarded as devil or spirit dwellings, are suitable places of propitiation. I heard of a chief who, in crossing the Sehwa at a dangerous point, threw a pair of heavy silver bracelets into the water, as a peace offering to the resident devil. Certain smooth black stones, the size and shape of an ostrich egg, are also regarded with reverence. These *N'gaffa-gōtuisia* (devil stones) are placed in little hive-like structures on the roadside, at the entrance of the town, over which they exercise their protective functions in return for the votive offerings of the people.

The belief in most conspicuous evidence regarding the *N'gaffaisia* is that they are not to be trusted. This creed issues in two methods of procedure: one is to avert their chronic displeasure by offerings which chiefly consist of food; the other is to neutralise their ire by the use of charms, amulets, and gree-grees. So strong is the belief in the efficacy of these things that some of the people literally load themselves with them, and from childhood to old age are haunted with a sense of insecurity which nothing but a "medicine" can allay. This great demand creates the sphere of the medicine (or gree-gree) maker, who is the self-elected priest and past master of everything occult and mysterious. His status depends entirely upon the gruesome character of his reputation. He has deadly secrets, and can make charms with which one may keep disease, devils, and witches at bay, or defy the weapons of enemies in the time of war. He can kill an adversary, find a witch, or read a fate: it is only a matter of price.

I have briefly touched upon the Mendi belief in *N'gēwo* devils (spirits), places of sacrifice, propitiation, gree-grees, and medicine men: but I must not omit to record that they indicate, by their burial customs, a distinct belief in another state, the

survival of the dead after death. Also, as I have said, they have the moral sense, though to their untutored minds it brings but a dim notion of accountability, and the sin seems not so much to consist in the act as in its discovery.

This condensed summary may not contain reference to every individual thing which would be included in a critical survey, but it covers broadly what may be termed the common religious elements observable in Mendi life. This is practically the sum total of his religion: his blurred consciousness of a spirit world, his conspicuously defective moral perception, and his pitiful endeavour to ward off a haunting sense of peril with gree-grees and sacrifice. Indeed, it must be confessed that they have only the remotest resemblance to the true essence of religion; they are fragmentary expressions groping in the twilight; chaotic elements without harmony or cohesion, and yet, possessing the first dreamy hints of spiritual realities to which they never will be awakened except by the true messenger of Christ's Evangel.

Here, then, we have a task for the Christian Missionary.* Let him go with the light of God, and kindle sacred fires upon altars too long dedicated to the sacrifices of darkness. We have an interesting intelligent people providing an inviting field for scientific enquiry, and finally, a fine productive country which will amply repay sound commercial enterprise, and a judicious investment of British capital.

LIST OF ILLUSTRATIONS.

1. View of Freetown Harbour.
2. The Map.
3. Street in Bonthe, Sherbro.
4. A Sherbro Trading Station.
5. The M'way Rapids.
6. Mendi Women Spinning and Carding.
7. Mendi Women Dyeing.
8. A Men li Loom.
9. Crossing the Tia at Mano-Kwé.
10. The Bo Road near Tikonko.

* The following Missionary Societies are already at work among the Mendies, viz:—The Methodist Free Churches with three important centres at Paitafoo, Mapoppi, and Tikonko, where European and Native Missionaries are resident; the Wesleyans at M'way, in charge of a Native Lay Teacher; and the Shengay Mission (American) at Mano Bargru, under a Native Minister. The American Mission at Rotufunk is also seeking to open a School at Tiamma, on the Tia River.

A NOTE ON LIFE AT BONTHE, ISLAND OF SHERBRO,
SIERRA LEONE.

By Mr. W. B. LEECH, Corresponding Member.

[Read to the Society, Wednesday, May 6th, 1896.]

WE are not as much out of the world as people think. There is no cable here, but we get letters weekly. Bonthe is a large place; eight Europeans are stationed here, and five more at York Island, an hour's journey from here by water and four or five more up the rivers, all looked after by a District Commissioner, who is stationed here.

We live on the premises, and the house is surrounded by stores and the shop (we, consists of the Agent and myself). Work begins at 6 a.m., about 7 we have a cup of tea, and at 10-30 close for breakfast. Commencing again at 12, we work till 5 p.m., when we close for the day, but are civilised enough to get afternoon tea about 3 p.m. I am responsible for the stores and yard, also for the measuring of produce and all other outside work. We trade in palm kernels and oil, also a little rubber. In exchange we give anything from needles to cooking pots, grey calico to jackboots, tobacco and spirits to perfumes, so there is plenty of choice.

There are two or three good shops, a native J.P., four churches—we sing anthems—a native doctor, also Police and Custom House Officers. The poor people are content with a coloured handkerchief for clothing, but the educated ones have their silks and laces, top hats and patent leather shoes. A man receiving £1 per month will turn out on Sundays dressed in full European “get-up,” wears a gold ring, *real*, carries a stick and smokes a cigar; he lives in a house built of wicker and mud, starves himself on rice, which he frequently eats with his fingers. He has a very high opinion of himself, is generally a rogue and distrusts everyone else. In short, the “educated” man is very objectionable and very bad to get on with; the bush man is much fairer and in many respects more honest. We have very comfortable quarters, live well, get fresh meat twice a week, in addition to about 60 chickens a month, not bad for the two of us (they cost 6d. each.) For amusements, fishing, boating, shooting and cards are the usual ways of passing spare time, of which, however, we have not much. It gets dark at 6-15 all the year round.

[Mr. Leech sent home a collection of native products which Lady Leech exhibited at the same meeting. Bonthe is shown on Mr. Vivian's photograph, page 5.]

WEST AFRICAN COLONIES.

The British West African Colonies are the Gambia, Sierra Leone, the Gold Coast, and Lagos.

The following Notes, taken from the "Statistical Abstract, 1896" (c. 8,210), may be of interest:—

AREA AND POPULATION—

	Sq. Miles.	Population.		
		1881.	1891.	1895.
* Gambia	69	14,150	13,057	§
† Sierra Leone ...	3,000	60,546	74,835	§
‡ Gold Coast.....	39,060	§	1,473,882	1,500,000
Lagos	985	75,270	85,607	§

PUBLIC REVENUE AND EXPENDITURE, 1895—

	Revenue.		Expenditure.
Gambia.....	£20,561	.....	£28,867
Sierra Leone	£97,851	.....	£96,690
Gold Coast	£230,076	£265,289
Lagos	£142,049	£144,484

PUBLIC DEBT, 1895—

Sierra Leone	£50,000
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VALUE OF TOTAL IMPORTS (INCLUDING BULLION AND SPECIE), 1895—

Gambia.....	£97,399	(Excluding transhipments)
Sierra Leone.....	£427,337	Do.
Gold Coast	£931,537	(Including estimated amount for Freight, Insurance, and Value of Packages.)
Lagos.....	£815,815	

EXPORTS (INCLUDING BULLION AND SPECIE), 1895—

Gambia	£93,537
Sierra Leone	£452,604
Gold Coast	£877,804
Lagos	£985,595

* Exclusive of Tenderbah, Bai, Kansala, Brefet, and Banjana.

† Estimate.

‡ Exclusive of Pokra, Okeodion, Ilaro, Addo, Igbessi, &c.

§ No returns.

THE RESULTS OF THE ASHANTI EXPEDITION,
1895-96.—(*See Map.*)

By His Excellency SIR W. MAXWELL, K.C.M.G., Governor of the Gold Coast.

[Addressed to the Society, in the Mayor's Parlour, Friday, September 4th, at 3 p.m.]

AMONG the various means by which the Manchester Geographical Society keeps itself abreast of the problems of geographical science in their relation to commerce, I find very wisely enumerated the examination of the possibility of opening new markets to commerce and the collection of information as to the number, character, needs, natural products, and resources of such populations as have not yet been brought fully into relation with British commerce and industry. I believe, therefore, that, in complying with the invitation of this Society to address its members on the subject of West Africa, I shall best satisfy them by describing a journey which I made through part of Ashanti, after the deposition of King Prempeh and the departure of the main portion of the expeditionary force, and by adding a few remarks upon the prospects and resources of the territory so recently brought under our effective control and opened up to British trade.

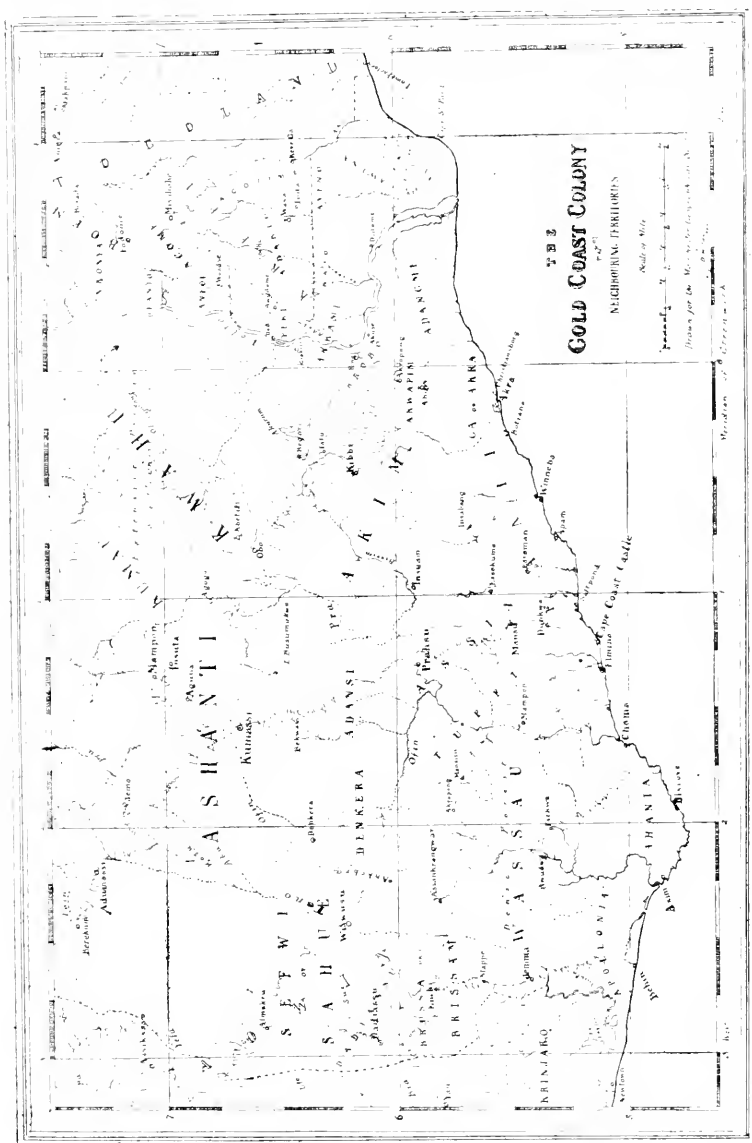
It will be remembered by those present who have watched the course of events on the Gold Coast for the past few years, that the best meant efforts of the Colonial Government to obtain by peaceful negotiations a satisfactory *modus vivendi* with the Ashantis were without result. We had to complain that the provisions of the Treaty of Fommanah were ignored, that there was continual oppression of neighbouring tribes, that inter-tribal wars, or threats of war, kept the inland populations in a state of continual unrest, that trade was, by these and other means, interfered with, and that road communication between Kumasi and our coast settlements was not kept up. There was also only too good reason to believe that certain barbarous customs, involving the periodical slaughter of human victims, were kept up in Ashanti, contrary to repeated promises and assertions. An ultimatum, sent by the British Government to King Prempeh, in October, 1895, was not attended to, and an expeditionary

force was sent to the Gold Coast from this country. Arriving at Cape Coast Castle about Christmas, 1895, this admirably-selected and equipped body of men, under Colonel (now Major-General) Sir Francis Scott, reached Kumasi on the 17th Jan., meeting with no armed resistance. King Prempeh made his submission to me on the 20th, and, in default of the payment of any considerable instalment of the war indemnity which was demanded, and failing any kind of guarantee that any substantial sum would be forthcoming, was conducted to the coast by the returning column, together with various members of his family and council who had been his worst advisers. Kumasi was temporarily garrisoned by detachments of the 2nd West Indian Regiment and the Gold Coast Constabulary (Hausas). The construction of a fort was commenced under the direction of officers of the Royal Engineers, and I was enabled to make a short tour (which I shall now describe to you), having for its object the pacification of the country and the conciliation of some of the tribes.

Imagine to yourselves a procession, in single file, along a narrow winding path, barely discernible in the dense forest, of a couple of hundred men, British officers carried in hammocks, Hausa Constabulary (admirable light infantry) serving as escort, and a large number of negro porters, each with a load weighing about 50lbs. upon his or her head. The scene is decidedly picturesque, but the details of African travel in the forest region are not, all of them, pleasant to the traveller. Unless the path has been carefully cleared beforehand, brushwood which has grown up since the last clearing impedes progress, while fallen trees cause difficulty and perhaps involve a détour through the forest. The sun beats down through the interstices of the leafy covering of the forest, there is a stifling absence of movement in the air and, as the day advances, the hammock-bearers and baggage carriers slacken their pace and move painfully with their loads. At last the halting place, a village in a clearing in the forest, is reached, native huts of the roughest kind are cleared out for the reception of the strangers, camp-beds are set up on the floors of a well-rammed clay, the porters and escort find accommodation somehow, and the preparation of a meal, of a more or less elementary kind according to the resources of the place, is commenced. If the weather is fine, the health of the party good, the drinking water tolerable, and the assaults of insects insignificant, travelling under these circumstances is not without interest and may even be enjoyable, but in the rainy season, or when the traveller is a victim to fever, a journey in an African forest is a trying experience.

I started from Kumasi on the 1st February to visit Insuta, in accordance with a promise which I had made to the King of that place, a man who, fortunately for himself, had left King

Prempeh's party and had asked for British protection before the events of January 20th. The officers who accompanied me



were Captain Donald Stewart (now Resident of Kumasi), Mr. Vroom, an African gentleman of Dutch descent, who acted as secretary for native affairs, Lieutenant Henderson, R.N. (my

private secretary), and Dr. Murray, as medical officer, an indispensable adjunct to an expedition of this sort. An escort of 100 men was furnished by the Gold Coast Constabulary, under Inspector Mitchell, who had commanded during the whole of the expedition the contingent furnished by the Gold Coast Hausas. Their fire and drum band went with us, and seemed to afford much amusement and satisfaction to the inhabitants of the various places through which we passed. It was not until the third day after leaving Kumasi that we reached Insuta, having passed through some eighteen or twenty villages, at two of which (Assinmaſsu and Asiaman) we halted on the nights of the 1st and 2nd February, respectively. It was on the second day's journey that I first experienced the wretchedness of travelling in a hammock while suffering from fever. The path had not been cleared because political differences had stopped all intercourse between the inhabitants of the villages at the opposite ends of the district; the hammock-bearers struggled along at the rate of about one mile an hour in the wake of a small party of labourers who cut their way in front; the sun poured pitilessly down on my hammock, deprived temporarily of its awning; and when Asiaman was reached I was only fit to surrender myself to the care and treatment of Dr. Murray.

Next day Insuta was reached, and we found the king and his councillors sitting in state, *more Africano*, to receive me. The place chosen for such meetings is usually the public square in the centre of a town or village. The chief takes up his position under the shade of a tree, and his headmen and followers range themselves on each side of him, forming the two sides of a horse-shoe, the relative importance of the individuals diminishing according to their distance from their master. Umbrellas are held over the more important men, who come provided with chairs carried for them by slaves. The persons to be received establish themselves opposite this group and bring their own chairs and umbrellas, if their rank entitles them to any. They then visit the chief's group and walk round the inside of the semicircle, shaking hands with each headman or councillor in turn, beginning at one side of the horse-shoe and ending at the other. Having regained their places, they await the return of the salutations. Presently the head chief rises and, accompanied by all his men of rank, approaches his visitors, who remain seated, and shakes hands by turn with each. His followers do the same. Then the horse-shoe is re-formed, and business commences. The conference or discussion—"palaver," as it is called in West Africa, from the Portuguese *palavra*—is conducted with much ceremony and politeness. Speeches are made on both sides, and the various headmen are entitled to rise in their places and express their views and opinions. Etiquette generally prevents the head chief from speaking for himself, and a court

functionary, called a "linguist," puts into the best language that he can command the arguments or statements which are confided to him in a low voice by his master. At all "palavers" which I attended during my tour—and they were necessarily numerous—Mr. Vroom acted as interpreter and translated aloud all that I said. This was then repeated to the assemblage in a loud voice by the linguist, and the response of the head chief was similarly proclaimed. From this it will be seen that repetition is the order of the day, and that a West African palaver is a somewhat tedious proceeding. At Insuta all passed off well. It was necessary to explain to the meeting the purport of a treaty which the king and chiefs had signed at Kumasi a few days before, and they were reminded that I had come to visit their town in pursuance of a promise then made. On this the king remarked, "the Governor is a man of one word," a reputation, by the way, which it is very desirable to establish when dealing with native tribes. The representatives of Insuta were then told that they must in future live at peace with their neighbours, as inter-tribal wars would not be tolerated; that they must clear their roads and maintain freedom of trade and communication; and that they must understand that the taking of human life is absolutely forbidden. Captain Stewart was introduced to them as the future Resident of Kumasi, to whom all important disputes must be referred. I then demanded, as an unmistakable sign to all the inhabitants that human sacrifice and cruel executions and mutilations would be henceforth forbidden, the public surrender of the executioner's knife, and after a very short discussion I had the gratification of seeing the knife produced and handed to Mr. Vroom, while shouts of joy arose from the crowd. I do not wish to enter into repulsive details, but I think it right that it should be known to those here that an execution or sacrifice in Ashanti is not the swift and painless extinction of a life which has been forfeited by crime. Specimens of the knives used are here for exhibition to-day, and it will be seen that they are inferior to the commonest kitchen knife seen in England. The head of the victim is hacked off from the back of the neck, his sufferings being only terminated when the butcher has severed a joint of the vertebral column. The slaves who used to be slaughtered at native ceremonies or "customs" were, of course, prisoners of war, or innocent persons torn from their villages by slave raiders, and sold into slavery by their captors.

On the 4th I continued my journey to Mampong, which is within six or seven miles of Insuta. Here there was political business of some importance to be done, for the king of the Mampong tribe (Osuche by name) had been one of Prempeh's chief supporters and councillors, and had been sent away with him to the coast. It was necessary to inform the chiefs and

people that their former king, Senkyere, who had been a refugee in British territory for some time, would now be restored to them as their ruler. This announcement was well received; but I will not trouble you with the details of the "palavers" which occupied this and the following day. Four days of incessant marching had fatigued my men a good deal, and it was necessary to rest at Mampong on the 5th. The results of my visit were a complete understanding on the part of the people of Mampong of the principal articles in a treaty of protection, and an undertaking on the part of the principal men to present themselves at Kumasi on the 9th February in order to receive their king and execute, together with him, the necessary engagement. Here, also, as at Insuta, the executioner's knife was surrendered amid the cheers of the people, whose confidence in the peaceful object of my visit, notwithstanding the presence of a detachment of Hausas, became more and more apparent. They related terrible stories of the barbarities perpetrated during a war of succession, when Mampong had opposed the election of King Prempeh, and had been punished by Kumasi in consequence. A spot in the market-place was pointed out at which the old and infirm among the prisoners of war had been burned alive by the ruthless conquerors, the young and able-bodied to the number of a thousand being carried off to Kumasi as slaves.

On the 6th I left with my whole party for Aguna, the goodwill of the people of Mampong and Aguna being manifested by the excellent condition of the path, which had been cleared from end to end. I was received on my arrival in the afternoon by the king and his head men, and the usual ceremonious greeting and public discussion followed. British protection was applied for, and it was arranged that a treaty should be executed at Kumasi on the 9th. The executioner's knife was given up.

Aguna is the centre of fetish worship in Ashanti, that degrading superstition which governs and debases the lives of the negroes on the West Coast, and which, carried by slaves to the West Indies and America, re-appears in certain places there as "Obeah" customs. The African medicine man is frequently a wholesale murderer. He is acquainted with poisons and can remove inconvenient persons, ascribing their deaths to a particular spirit or familiar. It is he, also, who demands the sacrifice of human victims at the funerals of important personages and on other occasions, and who foretells success or failure in war and other enterprises. The King of Aguna is a kind of hereditary grand medicine man to the Court of Kumasi, and his town, which is approached by avenues of sacred trees, and is full of fetish houses containing idols, testifies to the nature of his functions.

On the morning of the 8th I was back at Kumasi, it having been necessary to spend one night on the road between Aguna

and the capital. My short but interesting tour had been fully successful. An opportunity had been obtained for studying the attitude of some of the more important tribes of the Ashanti group, the people had been reassured as to our intentions, and the way had been paved for an important meeting of all the principal Ashanti "kings" at Kumasi, when treaties of protection would be executed.

I observed little, I fear, that is of special interest to geographers. Cotton seemed to grow well, and I saw bushes of this product at most of the villages. At Insuta I was shown a specimen of the rice which is grown there. It is upland rice, and much inferior in quality to that which is grown in flooded fields in other countries. The monotony of forest scenery was only broken once during the journey by a curious sandstone bluff at Akyiabuassi, not far from Insuta. A wall of rock, which has almost the effect of masonry, so regular is the stratification, rises abruptly from the forest-covered plain and forms part of a low range of hills, crowned by stunted trees and coarse grass. The object of my journey was political, not scientific, and I am afraid that ignorance of the language (though I had the benefit of Mr. Vroom's interpretation when necessary) and indifferent health prevented me from learning much that would be of interest to your Society.

The narrative of this tour is not complete without a short description of the proceedings at Kumasi on the 10th February, when seven separate treaties were executed with the representatives of Ashanti tribes. The purport of a treaty of protection should be known to missionaries and explorers, so I may summarise the articles as follows:—

1. The king, chiefs, and people place themselves under the protection of Great Britain.
2. The Governor, on behalf of Her Majesty, promises protection.
3. It is agreed that inter-tribal war will not be undertaken, and that differences will be referred to the arbitration of the Governor.
4. Disputes between the king of a tribe and his subordinate chiefs will be referred to the Governor for settlement.
5. The right of British subjects to enter the country, build houses, acquire property, and carry on trade is conceded, subject to proper conditions.
6. The king, chiefs, and people bind themselves to maintain roads, encourage trade, and give facilities to traders.
7. It is declared that human sacrifices and slave dealing will not be permitted.

I may, I think, conveniently describe to you the execution of the treaties in the language in which I reported it to the Secretary of State immediately after the event:—

“All the kings and chiefs having assembled at Kumasi, I received them officially in the public square on the afternoon of the 10th. A guard of honour was furnished by the 2nd Battalion W. I. Regiment, and most of the officers, civil and military, not on duty, were present. The kings and chiefs of Mampong, Kokofu, Juabin, Kumawu, and Aguna, and the representatives (women) of the stools of Ofinsu, and Ojisu, with the chiefs of those districts, having taken their places, I asked them to declare publicly whether it was their desire to place their respective countries under the protection of Her Majesty, and to enter into the treaties, the terms of which had been translated and fully explained to them that morning. All answered in the affirmative. I then told them that there is no desire to interfere with native administration further than is necessary to secure the due fulfilment of treaty conditions, that each country will be separate and independent, and must not interfere with its neighbours, and that old feuds and hatreds must be forgotten. Addressing the kings of Mampong and Kokofu, I reminded them that they had been refugees in British territory, and were now being restored to their countries by British influence, and that if they misused their powers I should regret having helped them. I gave a special warning to Senkyere, King of Mampong, who had formerly a reputation for cruelty. The chiefs of Mampong were then called up, and I formally made over their “king” to them, receiving thanks and expressions of satisfaction on both sides. All the treaties (seven in number) were then executed, and I delivered flags to the persons entitled to receive them. The meeting terminated with an incident which will, I hope, have considerable political significance among these tribes. The king of Bekwai, who was present as a spectator, came forward and asked that as the Kokofus are being restored to their country (which adjoins Bekwai) I would effect a reconciliation between the two tribes, Ashibi, the King of Kokofu, was then called up, and I told both parties that past wars must be forgotten, that slaves (prisoners of war) must be given up, and that there must be peace and friendliness between the two tribes in future. Both kings promised obedience and shook hands and embraced.”

The scene was a memorable one. As there were no less than seven treaties to be executed, all the available camp tables were brought out into the square, and officers presided at each and dealt simultaneously with the representatives of the various tribes. The gaily decorated umbrellas of the chiefs, the groups of native spectators, the line of West Indian soldiers, and the background of tall forest trees encircling Kumasi made up a

picture which it will not be easy to forget. A present was made to each chief at the end of the ceremony, and next morning all dispersed to their respective towns, and I was able to start on a nine days' journey to Cape Coast Castle, paying a visit to Bekwai on the way. I may conclude this account with another extract from my despatch to the Secretary of State above quoted:—

“I reached Cape Coast on the 19th instant, after an absence of forty-two days, twenty-seven of which were spent in travelling. I have left Ashanti absolutely peaceful, and with ordinary tact and prudence, a British Resident should, in my opinion, be able, without recourse to repressive measures, to require due observance of treaty obligations, while interfering as little as possible in the local administration of the affairs of each tribe. Perfect safety for missionaries, if they are only ordinarily prudent, has been secured; and I am glad to be able to report that when I left Kumasi Messrs. Ramseyer and Perregaux of the Basel Mission were already there at my invitation, and that steps were being taken to provide them with a site for mission buildings. A representative of the Wesleyan Mission was at Bekwai. It is only, however, by the disappearance of King Prempeh and the persons whose interests were bound up with the maintenance of the old state of things, that the confidence of the people in the determination of the British Government to insist upon peace and humanity has been secured. The profound effect caused both in Ashanti and in the Protectorate by the peaceful removal of a native potentate so universally feared as the King of Kumasi can hardly yet be fully appreciated. Little or nothing would have been accomplished by the expedition had its only result been the submission of the king, the execution of a treaty, the payment of a small sum, and the establishment of a Resident at Kumasi. The surrounding tribes would have received no lasting impression of British power, and the immunity of the king and chiefs from serious consequences (for no substantial annual payment could have been got from them without recourse to force) would have been ascribed to successful fetish influences, adding, perhaps, to the belief of Kumasi chiefs in their own superiority. The return to power of any of the persons now detained as prisoners at Elmina Castle would threaten the independence of the kings and chiefs of the various tribes with whom separate treaties of protection have, with your approval, been executed. On the other hand, the absence of any central authority at Kumasi, exerting an unseen anti-British influence, will enable the Resident to enforce, peaceably, the performance of treaty conditions by the various tribes, impressed as they are by the object lesson of which they have been witnesses.

“The surrender to me at Insuta, Mampong, Aguna, and Bekwai, of the executioner's knives has been no meaningless

ceremony, but has had its moral significance. No one who witnessed, as I did, the change that came over the faces of the audience as it was explained that wanton executions and inhuman customs would no longer be tolerated, could fail to be impressed with the conviction that the men and women who listened had been living under an ever-present terror from which they were now being relieved. And by simple-minded people, who did not wait to argue that the absence of a particular instrument of death would not prevent the employment of another, the figurative aspect of the ceremony was readily understood. It will be only by slow degrees, as the confidence of the people is gradually won, that details of the horrors and cruelties which have been perpetrated in Ashanti towns will become known; but I have heard and seen enough during my recent tour to convince me that the destruction of the central power of Kumasi has been the means of procuring for thousands of human beings immunity from no unreal fear that death in some horrible form might at some time be their fate."

The eastern and northern tribes having thus been re-assured and conciliated, it was necessary to arrange that the other outlying tribes should be visited, and on the 12th February two officers of the Gold Coast Constabulary (Assistant Inspectors Davidson-Houston and Armitage) with a medical officer (Dr. Coker) left Kumasi, with my instructions, to visit the districts lying between that place and the French sphere of influence, to make treaties of protection with the chiefs, and to return to the Coast through the little-known provinces of Wam and Ahafu. The first place visited was Jemo, in the district of Bechim-Ahafu, and here the conditions of a treaty of protection were explained to the head chief and his people, and a treaty was executed on the 22nd February. In the beginning of March the mission was at Adumassi, in the province or country of Borumfu, which adjoins Gaman, and there a head-chief was installed and a treaty executed. This action will, it may be hoped, restore peace to this district which, lying between Gaman and Ashanti, has been claimed by each in turn. The British officers above-mentioned found towns abandoned, chiefs living as refugees, and the people scattered in bush-villages—all this because the king of Gaman (a territory which is partly in the British and partly in the French sphere of influence) had, some years ago, attempted to secure exclusive jurisdiction in Borumfu.

For the greater part of a month the detachment under Captain Davidson-Houston remained in the neighbourhood of the, as yet, undelimited frontier between the English and French spheres of influence. The British officers were thus able to judge for themselves of the state of things created by the incursion of the Mohammedan chief Samory into Gaman, the chief town of which, Bontuku, is still in his power. They report that

"whole districts have been devastated and denuded of food-supplies, towns have been looted and burned, and the inhabitants captured as slaves. On several occasions we came across skeletons and decomposing corpses in the road itself, while it was stated that Bontuku resembles a charnel-house from the number of dead bodies lying about."

Samory, who has for some time past been living in the country of Djimini, on the right bank of the Komœ river, has made himself master of Gaman, a State with which we made a treaty of friendship and commerce some years ago. The greater part of Gaman, however, was recognised as being within the French sphere by the Agreement of July, 1893, and our relations with King Ardjiman, of Gaman, have since then been confined to the eastern portion of his territory bordering on Ashanti.

The methods of procedure of this African conqueror are well known, for Colonel Binger, the French traveller (who was recently Governor of the Ivory Coast), visited him in his camp when he was besieging Sikasso in 1887, and has graphically described the horrors which characterise native warfare in the French Soudan. He credited Samory at that time with an army of 5,000 fighting men and with about the same number of non-combatants, namely, women, prisoners, boys, horse-keepers, medicine-men, artisans, and porters. Colonel Binger travelled through a region recently traversed by Samory's forces, and saw how a body of fighting men is maintained in this part of Africa. In the first place, supplies are drawn from the provinces or districts which form a recognised portion of Samory's territory, and which furnish each a contingent of warriors. The Almamy (as Samory is called) is entitled to a share of the crops, and this is dispatched to him from time to time, the villagers supplying porters, each carrying 10 or 15 kilogrammes of grain. Besides this contribution, the chief of the village, who is probably with the army with his contingent, has to be supplied, and when the wretched peasants have complied with these demands they still have to spare what they can for their relatives or friends who may be among the fighting men. These convoys of provisions are guarded by armed escorts. When a village is taken, or makes submission, all the horses, cattle, goats, &c., are seized for the Almamy, and these are placed under the charge of trusted slaves, who are also entrusted with the duty of watching all the growing crops until they reach maturity, when the produce is sent to headquarters. According to Binger, who was an eye-witness of all the incidents of this system, the supplies received daily would have been sufficient for 8,000 men. But there was no proper distribution, and the influential men helped themselves largely, while the rank and file literally died of starvation. Corpses dotted the line of

march everywhere in the vicinity of Samory's camp, and these were not only the bodies of the miserable peasants of the district, but those of soldiers and camp-followers belonging to the invading army. In order to obtain supplies of gunpowder and lead, and in order to get horses for his few squadrons of cavalry, Samory has to sell slaves; and Colonel Binger calculated that for the purchase of gunpowder alone this chief had to part with 800 slaves a month, one slave being equivalent in value to 5 kilogrammes of gunpowder and one horse costing ten slaves! When a raid takes place or a village is taken, all the fighting-men who are captured are put to death and the women and children are taken to the Almamy, who appropriates half of the women and girls as slaves and leaves the rest to the chiefs and warriors who have carried out the capture. The boys then become horse-keepers and gun-bearers to their masters, and eventually, when they have grown up and have taken part in several expeditions, they are permitted to wear the trousers which are the distinguishing mark of a *Sofa*, or Soudanese soldier, and become regular fighting-men.

The recent observations of our officers in British Gaman coincide with what has been so well described by the French official whom I have quoted.* They found at Banda and other places all the supplies of food in the hands of *Sofa* guards, who had summarily requisitioned them according to the African method. It may be understood, therefore, that wherever Samory's bands of raiders go there is murder, plunder, and leading into captivity. It is only by seizing and selling slaves that they can maintain themselves. To get slaves they must attack towns and villages of which the inhabitants are too weak to resist them. The grown-up men, who would not be tractable as slaves, must be put to the sword, while all the food of the district must be seized for the use of the invaders. One of the results of the Ashanti expedition is, it is hoped, the closing of one of the chief markets for the slaves captured by these Mohammedan raiders. The court of Kumasi required a constant supply of slaves for all purposes, including the periodical human sacrifices which have made Ashanti notorious, and this source of demand has happily ceased to exist.

The British detachment returned through the Ashanti provinces of Wam, or Doma, and Asunafo-Ahafu, and the chiefs and people of these districts were formally taken under British protection by treaties made at Pamu on the 21st April last, and at Kukumu on the 2nd May. The consequence will, I hope, be an increase in the volume of trade between these countries and our coast stations. The chief products of the former are kola-nuts, rubber, and monkey skins, kola being most abundant in

* "Du Niger au Golfe de Guinée." Binger, Paris, 1892, Vol. i., page 98.

the country near the Tando river, while rubber abounds throughout Bechim-Ahafu, Borumfu, Wam and Asunafo-Ahafu. North of Pulliano little or no rubber is produced, but Shea-butter trees (*Bassia Parkii*) are numerous. Gold-mining operations in the primitive native fashion were remarked in many places in Ashanti and British Gaman, and apparently there is enough alluvial gold to make the fortunes of a less apathetic and indolent population than the negro tribes of West Africa.

At some of the towns and villages I observed baskets of kola-nuts ready packed for transport. This is the most valuable product of Ashanti. There are two kinds, the white kola (*sterculia macrocarpa*) and the red kola (*sterculia acuminata*). It is the latter which is most common in Ashanti. The nut or seed, of which a single fruit or pod contains a good many, has very valuable properties. It is chewed by the people of the inland districts as a mild tonic and stimulant, and occupies among them the place which is held by the areca-nut and betel-leaf in Eastern Asia. It soothes the nerves, calms hunger and thirst, and stimulates the power of resistance to fatigue. Its taste is astringent and bitter, and its effect upon some persons is much the same as that of coffee. Kola-nuts the inland populations must have, and the traders of the north come down continually to the countries where the precious plant is to be found. The region of production lies between the seventh and eighth parallels of latitude, and the red kola of Ashanti commands everywhere a better price than the white variety. As the kola-nut of native commerce has to be transported for enormous distances, and as there is no means of transport in some places except human portorage, this product has to be very carefully packed in order that the nut may not become dry and hard and so lose its value. For this purpose a particular kind of leaf, found in damp and shady localities, is used, and this preserves the nut in a fresh and moist condition. Kola-nuts carefully packed in this way reach Timbuctoo and Kano (Sokoto) in good condition, though these places are both a three months' journey from the place of production!

It remains to be seen whether a revolution in the kola-nut trade of Ashanti will not be one of the results of our recent policy. Native trade is generally hampered by the existence of middlemen, the people of intermediate States absolutely refusing to allow the producers on the north and the vendors on the south to come into contact, but reserving for themselves the right of controlling the market. In this way the people of Kinjabo have always interposed themselves between the European traders of Grand Bassam and the tribes of the interior, and similarly, Kumasi has in the past stood persistently in the way of free trade in the kola-nut. If the trade is now diverted to some extent to the coast the Ashanti kola-nut will perhaps

be exported thence to other West African ports, finding its way again to the interior by means of river communication. It is, I believe, already exported to Lagos, and this trade will no doubt extend.

I have still to mention to you one more journey undertaken by British officers since the conclusion of the operations in Ashanti, having for its objects the legitimate extension of our influence, the development of our trade, and the improvement of the condition of the native inhabitants. Colonel Pigott, the acting Resident of Kumasi, has lately been at Kintampo, a town in the province of N'koranza which has at one time been and may again be an important trading centre. Captain Kirby gave an account of this country in the Proceedings of the Royal Geographical Society, in 1884, and to this I must refer you. He says:—"Some 80 or 100 miles north of Kumasi, the first open country is entered. It consists of long grass, with a few stunted trees, and resembles an apple orchard in winter. On leaving the dense bush, the soil becomes sandy and mud houses cease, circular grass huts taking their place." Kirby described the place as being resorted to by thousands of Hausa traders from Timbuctoo and elsewhere, and estimated the Ashanti population alone at 3,000 or 4,000. An account of his expedition will be found in Parliamentary papers, c. 4471, p. 85. Colonel Binger, who was at Kintampo in the end of 1888, has described it as being at that time a busy place, with a population of about 3,000 souls, of whom about 800 were temporary sojourners, attracted to the town as a market where cattle and slaves could be bartered for kola-nuts, salt, and other articles required by the inhabitants of the States further inland.

Since then, Kintampo has undergone various misfortunes, and its trade has been diverted further east, while the town itself is said to have been destroyed in one of the petty wars so common under the old Ashanti régime. But as a new era of prosperity may yet be in store for this place, which is now under our direct control, you may like to know what the French traveller said about it eight years ago. I translate Colonel Binger's own words:—

"Kintampo would occupy a highly advantageous position in this region if the Ashanti chiefs would only be less exacting and if they did not block communications with the coast. As a matter of fact a nearly straight line starting from Christiansborg, passes through Kumasi and N'koranza and proceeding thence, connects Kintampo with Bualé. Here there is a bifurcation, the western route going by Bona and Lobi to Diulasu and Jenné, while the eastern one strikes off to Wa, Wa-Lumbalé and Sati to Wagadugu, Mani, Duentsa and Jilgodi. There are thus two great arteries along which kola-nuts find their way inland as far as Timbuctoo, and, along with kola-nuts,

various European products. Unfortunately, in the matter of the trade in salt, Kintampo is less favourably situated than Salaga where this article can be put on the market at a comparatively cheap rate, because river transport (the Volta) is available as far as Kraki. Further, articles of European importation only reach Kintampo by way of Bontuku, which accounts for the fact that I did not find this market town in as flourishing a condition as I expected."

It remains to be seen whether, with the removal of the tyrannical interference on the part of Ashanti chiefs, to which Binger ascribed the divergence of European trade *viâ* Bontuku, it will be possible to re-establish at or near Kintampo, a mart to which the busy Hausa and Mandigo traders will resort as in old days. It ought to be possible to do this, and now that traders can pass along well-cleared paths from Cape Coast Castle to Kintampo, with their safety guaranteed by the presence of detachments of the Gold Coast Constabulary, there should be before long, a noticeable improvement in the volume of the inland trade.

From what I have said, it will, I think, be apparent that we are doing something to obtain the results which generally follow where British interference has been established and where British influence has been rendered paramount. Peace has been established, and by the recognition of the independence of the various tribal "kings," or head chiefs of provinces, it has been made the interest of each to carry out the directions of the protecting power. Life and property have been rendered secure, or at least more secure than they have ever been in the history of Ashanti. It has become possible for missionaries to settle in Kumasi and other towns, from which they have been persistently excluded in the past. We may now confidently look for the spread of civilisation in this region and for the revival of commerce, which is the natural consequence of the *pax Britannica*.

I can tell you little of the Ashantis, as a people, from personal observation, for the circumstances under which I travelled, and the not unnatural fear and doubt which filled the native mind at the time, made it difficult to study them fairly. I should, however, judge the Ashanti tribes to be, as a race, decidedly superior to the Fanti tribes on the Coast. They have more pride of race, they are probably more industrious, and though they are described as false, plausible, and cunning, they are probably more capable intellectually than the Coast tribes. They are slighter in build than the Fantis, and are sharp in appearance and active. They have some skill in working in brass. At present they are entirely in the hands of their fetish-priests, the expounders of the foulest system of superstition known in the world. It remains to be seen what the educational advantages

about to be offered to them by the missionary societies will do for them.

The form of government of the various provinces, under the general control and observation of the British Resident, will be much the same as that which obtains in the more remote districts in the Gold Coast Colony. There will be as little interference as possible with native customs, or with the management of their affairs by the several chiefs, provided that there is no cruelty or inhumanity and no wilful injustice.

Under the government of Prempeh and his predecessors, the occupant of the Golden Stool was entitled to half of the produce of every gold mine. This exaction was not calculated to encourage the production of this precious metal, and it may perhaps prove that under less onerous conditions, alluvial gold-mining will be more extensively resorted to. No chief has the power to make a concession of mining rights, and the approval of the Governor is necessary for acquisition of such rights by strangers.

The great distance of Kumasi from the coast (150 miles), and the difficulty attending transport, must continue for some time to retard the development of the mineral resources of Ashanti. Railway communication will, no doubt, come some day, but there are many preliminaries to be settled, and these (as regards the Gold Coast Colony) are receiving attention.

Kumasi and the Ashanti towns are not much more than bush-villages situated in clearings in the forest and are not to be compared in importance with some of the walled and fortified towns met with elsewhere in West Africa. Kumasi derived its chief importance from the presence of the king and his family and court, necessitating the constant residence there of a large number of chiefs, petty officials, slaves, etc. It was never an important trading centre, but there ought now to be a likelihood that a desire for articles of European manufacture will be fostered, and will gradually extend. Hardware, iron, tobacco, and cloth goods should then be in increased demand.

It is not impossible that for some time the comparatively untutored Ashanti will require some protection at the hands of the Resident and his officers from the sharp practice of the better-educated native trader from the Gold Coast. The natives of the "bush towns" inland are easily imposed upon, and are not unfrequently the victims of frauds perpetrated by English-speaking natives of the coast. One of these latter will possibly profess to have official authority to investigate complaints, settle disputes, and levy fines, and will successfully exert his assumed powers for some time, living on the fat of the land and pocketing a considerable sum by his exactions. Even in this assembly, a warning against certain practices of some African traders, often very plausible men, may not be out of

place. There was exposed in the colony a few years ago a regular system of what were known as "surf frauds," the actors in which obtained considerable sums by claiming the value of imaginary cargo alleged to have been lost in the surf between the shore and the ship. The details were ingeniously worked out and required considerable business knowledge and, if I mistake not, some talent in the imitation of handwriting. Then there is the man who professes to have a large commercial business, and who writes to mercantile houses in Liverpool or Manchester asking for samples or for a trial consignment of goods. Needless to say that samples or goods are turned into cash at once and that the shipper hears no more of his correspondent. I might also perhaps include among these incidental products of African civilisation the native who assumes in England the title of "prince" in order to obtain special recognition. In West Africa, "kings" are more common than justices of the peace are in England, and if all their children and grandchildren were princes and princesses the proportion of these to the untitled population would be very striking! It is well to remember that, among most tribes in West Africa, descent goes in the female line. The "stool," or throne, goes, not to the king's son, but to his nephew, the son of his sister. The son of the King of Ashanti has no rank, and the grandson is nobody at all, while the nephew (son of the king's sister) is a possible heir to the "stool." In Africa a king's grandson is no more entitled to special consideration than is the nephew of the nephew of a peer with us!

A Manchester audience will, I am sure, pardon this little digression, for among the results of the Ashanti expedition I must include an opportunity afforded to me of reading some curious correspondence, some of which justifies the warning which I have given. I remember seeing, among other letters, one from a native trader at Cape Coast to a native friend of his in London. He begged the latter to do him a good turn by introducing him by name to some British mercantile house which would supply him with a consignment of goods on credit, and suggested with the utmost candour that it would be well if the firm selected for this experiment were one not yet acquainted with the African trade!

I must not be mistaken as implying a general condemnation of native traders. There are sharp and not always very scrupulous men of business in all countries, and all I wish to convey is a warning that some Gold Coast methods have occasionally given trouble to the authorities, and that the African, unintroduced and unvouched for from some respectable source, is not always to be taken at his own valuation. I have thought it well to say this when I have the opportunity of addressing an audience among whom there are, perhaps, representatives of commercial houses in Manchester.

I have now detained you sufficiently long, and I must conclude this paper by expressing my regret that I have not been able to render it attractive by the use of pictures and lantern slides.

We are only at the beginning of things in Ashanti, and it will not be for some time that we shall completely know the full effect upon British commerce of the opening up of that country. The marauding bands of Samory may continue for some time to disturb the Hinterland in the French, British, and even, further East, in the German sphere of influence; but, leaving out of consideration for the moment this unfavourable factor in the situation, the Chambers of Commerce of Manchester and Liverpool may, I think, be well content with peace and order in Kumasi and other towns, the removal of tyranny, and the opportunity for increased trade, which are among the results of the Ashanti Expedition.

The Nicaragua Canal.—The waterway is to start from Greytown, where it is proposed to create a harbour, if this is not impossible as some suppose. Proceeding towards Lake Nicaragua and the Divide, ships are to be lifted through three locks, with a rise of 45, 30, and 31 feet respectively. They will then pass through the Divide, an excavation under three miles long, and for which 12,000,000 cubic yards must be removed, of which 7,000,000 consist of solid lavas, etc. They will next navigate a series of vast basins and the San Juan river to Lake Nicaragua. In order to produce these navigable waters, a series of gigantic dams is to be made. That at Ochoa over the San Juan valley is to be 1,250 feet long and 70 feet high, and there are many others from 70 to 20 feet in height. These dams are to be made by stretching cable trams across the valley, and patiently tumbling down rocks until these find a permanent home in its bed and gradually form the embankment. Lake Nicaragua, with some 1,200 feet of dredging, affords a waterway of 56½ miles, after which the ships are to be conducted down the Rio Grande valley to Brito. This valley will be turned into another reservoir by a huge embankment 1,800 feet long and 70 feet high, and three more locks are provided to lower the ships 110 feet, whence they will proceed to the proposed harbour at Brito, and emerge on the Pacific. This truly gigantic undertaking, the cost of which is estimated at £30,000,000, will, according to Mr. Archibald Colquhoun, "certainly be made." Three points are, however, considered by some authorities to be impossible, viz., the Ochoa dam, the Divide excavation, and the Greytown harbour. His book contains full details of the scheme, and an account of Nicaragua, which we may briefly describe as a sort of large West Indian island, with an annual rainfall of 290 inches, and corresponding climate. By no means the least valuable portion of "The Key of the Pacific" is Mr. Colquhoun's description of the probable effect of the canal on the world's commerce. Melbourne and Yokohama will then be 9,287 and 8,650 miles from New York, whilst at present they are 11,350 and 11,765 miles from Liverpool. This scheme will therefore "bring about the most serious rivalry to the commercial supremacy of Great Britain which she has yet to encounter." Moreover, it is to be an "American canal in American waters," though, in some not clearly defined manner, "neutral." There is a historical summary, from which it seems clear that, if the English traders of 1698 had refrained from destroying Paterson's Scottish colony at Darien, we should now hold this "Key of the Pacific." The book is abundantly provided with illustrations, some of which are not particularly clear, and the engineering and other details are very fully described.—*Proceedings of the Royal Geographical Society, March, 1896.*

THE NIGER RIVER AND TERRITORIES.

(See Map.)

By Mr. J. HAMPDEN JACKSON, Liverpool.

[Addressed to the Society, in the Library, Wednesday, December 16th, 1896.]

It is always of interest, in connection with the great River Niger, to go back to the time—but eighty years ago—when the map I show upon the screen represented all that was known to scientific geographers—even in our own country—of its course and final exit. In the succeeding slides you can trace the progress of human knowledge as to the entire fluvial system of Africa and see what strange errors had arisen, what wondrously near guesses had been made, and what actual relapses had set in, in the period of over 2,000 years since Herodotus described from hearsay a certain “Nile of the Negroes,” running eastward from a direction we now know to have been correct. It will probably be a century hence before men fully realise the extent of the world’s debt to those English noblemen and gentlemen who, in the last decade of the last century, sent forth Mungo Park as their emissary to find and trace specifically upon the map all he might discover as to this mysterious river. Their choice of the man was exceptionally fortunate.

I pass over all their disappointments, and the persistent courage with which they bore them, and need only remind you that these Englishmen of the African Association—soon afterwards to become the Royal Geographical Society—not only found and equipped Park, and Clapperton, and Lander, but it was at *their* cost, on *their* business, and for *their* enterprise alone, that Barth, the German explorer (whose brilliant and most accurate explorations are in our day constantly credited to his own nation instead of ours), undertook and finished his great journeys into Hausaland from North Africa.

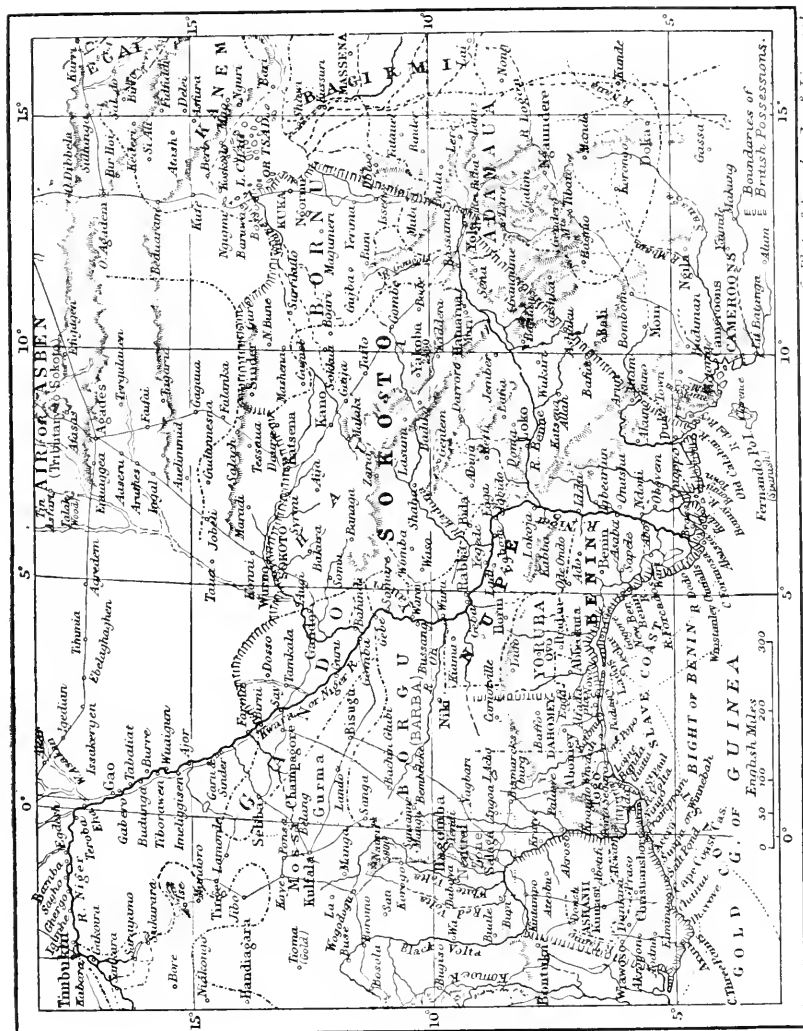
My pictures to-night are so arranged as to enable you to follow Park from his first discovery of the Niger at *Sego*, to look with him on the breadth at that spot of its stream, to realise his disappointment at having to return to England; his joy at coming for the second time to Bambarra, and then his voyage in the little craft bearing his country’s flag down to the devious waters of the unexplored river; past *Kabara*, from whose hill-top he might have seen Timbuktu had he but known, and had he not been attacked there by the people on trying to land. Next we sail with Park past *Birni*, close to the capital of the former Songhay Empire, past *Say*, where the Niger is 700 yards broad, past *Tiborawen*, where islands break up the stream, to Boussa, the capital of Borgu, 650 miles from the sea; and here on that memorable day of 1806 we see poor Park meet his death, and I hope it may not be long ere some worthy obelisk at the spot shall set forth indelibly the great record of his mission.

We come now to Richard Lander, and in like manner I take you over the route of this famous voyager, from Badagry (whence he struck inland) to Boussa, where he found the relics of Park, and then in his boats downstream past Mount Jebba—standing midway in the river, with an elevation above sea level of some 300 feet—past Rabbah—then the largest city on the Niger—to Egga, where the great ferry of the Kano-Ilorin traffic makes prosperous the chief port of Nupé, and now—in the distance—appears the table-topped Mount Patteh, rising 1,300 feet from the right bank, and as we sail with Lander under its shadow, there opens out before us the noble confluence at Lokoja, where the Benué, the Niger's mighty tributary, pours its mile-broad current into this great West African river. Next Lander passes between the jagged and stunted peaks of the Nigretian Alps, and nearing Idda, sees its bold precipices of red sandstone rear themselves on the left bank, and admires the giant baobab trees, the clustered round-roofed huts, and the busy throngs of Igara people passing to and from the river-side. But our explorer has vowed to follow the great Niger to its outflow, and we are still some 280 miles from the sea.

So Lander passes on in his boats, and nearing Asaba—now the seat of English government on the river—he notes that the native houses are now all of rectangular shape, and the people of Eboe type, and soon he is at Abo, and the tidal waters are recognised just as the ruffians of the Brass slaving fleet rush upon him and—capsizing his craft—Lander barely escapes with his life, to find his brother drowning also. Rescued at last, John Lander is brought prisoner, together with Richard, to the Brass mouth of the Niger, and their sufferings whilst waiting release and subsequently until landed at Fernando Po may well have made them dread the name of Brassmen. By the kindness of Mr. John Holt, of Liverpool, I am able to show you the photograph of the grave of Richard Lander in Fernando Po, and it may be that some day, at Brass or Akassa, English hands will raise a fitting and permanent memorial to this modest, uncultured, and sterling character, who solved for us and for all mankind the greatest geographical problem of his time, and opened the door for European commerce and civilisation into West Central Africa. It must not be forgotten that MacQueen had all along contended that the Niger would be found to issue into the Atlantic through the swamps of the Bights of Benin and Biafra, nor are the reasons now obscure that account for that long hiding of geographical truth in the Gulf of Guinea. The Niger delta I now show you is one covering 14,000 square miles; the Delta rivers creep into the sea almost unperceived through the low-level mangrove swamp; the whole region reeks with fevers and dysentery, and at the time of Lander's discovery the only trade to be done in that "God-forgotten Guinea" was the slave trade. Such white men as ventured to the Delta, therefore, were bent on secrecy rather than on discovery; and this had been the state of things for centuries. No wonder that the Niger had been a mystery, but it was a mystery no more.

The next step for its exploration was taken by Liverpool. Macgregor Laird, whose name Manchester should never forget, raised a large fund among his merchant friends on the exchange, and added thereto a large part of his own fortune, built and equipped two steamships—the "Quorra" and "Alburka"—and (with but little aid from Government) took charge personally of this bold expedition, and in 1832 sailed for the Niger. My pictures give you an idea of the risks and vicissitudes encountered by this intrepid

townsman of mine in thus ascending for the first time in deep-water craft a river whose navigation was supposed to be easy because as yet nothing was known to the contrary. Now, look at these banks, forty feet at least above the river level, and remember that for three to four months of the year the



(From *Philips & Son, London & Liverpool*)

THE NIGER TERRITORIES AND LAGOS AND GOLD COAST COLONIES.
(Especially prepared for the Manchester Geographical Society by Messrs. G. Philip and Son.)

villages lining them are simply floating in the vast waste of the Niger inundations. Sir Harry Johnstone has very kindly allowed me the use of his clever drawings of these inundations in the Delta, and Mr. Laird found by a bitter experience that it was all very well to steam up the Niger when the stream was at flood, but when your crew were all down with fever, and the river began to

fall at the rate of a foot per day, the least accident—such as the stranding of the little “*Quorra*”—locked you up bag and baggage for a whole twelve months, and brought you face to face with terrible dangers. The mortality on board the steamers was awful, but Laird kept the expedition well in hand; he explored a great part of the upper middle Niger, a considerable distance up the Benué, and established the first English trading factories, 350 miles from the mouth of the Niger, ere his return to Liverpool. Like all other travellers who have seen the Benué, Laird was greatly impressed with the volume and purity of its waters, the beauty of its landscape on either bank, and the rich promise of development in its already quickened commerce. A few illustrations and photographs on the screen help you to realise this, too. Look at the woodland beauty at Ribago, for instance; or the fine cultivated plain at Yola; and the impressive rock-fortress at Imaha. And see these fine Hausa peoples who inhabit the Sokoto and Bornu countries of the inter-riverine plateau. They are an ancient race, grave and industrious, of fine physique and highly intellectual phrenological type.

Centuries ago Macrisi—the Egyptian historian—told of their gourd-ferries, and the world laughed at such a “traveller’s tale;” but here you see them for yourselves. Centuries ago men wrote of the vast city of Timbuktu, but what is Timbuktu to Kano, the Hausa capital? Look at this wall surrounding Sokoto City, and think of the wall of Kano being as high as that and fifteen miles round! The Fulah aristocracy live at Sokoto, and their Sultan bears spiritual rule over the greater part of Hausaland; his temporal power is no myth, either, for in 1891 he raised an army of 40,000 men—half of whom were cavalry—under the eyes of Monteil. But the crumbling houses of Sokoto tell their own tale of a city that has long passed its zenith, and like Timbuktu, whose population has fallen from 200,000 to 7,000, like Katsena, population has fallen from 100,000 to 6,000, so Sokoto is daily yielding its temporal sceptre to Kano, the city of markets and manufactures, the centre of literature as well as of prosperous agriculture, the starting-point of the Soudan caravans, the central slave market, cloth market, metal market, and the busy focus of all industries. See this great market square in which 30,000 people assemble for commercial exchange every week; these fourteen gates, through which the hosts of organised caravans are ever issuing, most of them 600 or 800 strong at the very least, and twenty of which go every year to Salaga for kola-nut alone! Think of the Mecca pilgrims who all assembled here to form their great cavalcades yearly; of the 60,000 artificers and cultivators living in this Kano, with its enclosed fields of rich crops, its leather factories, shoe and sandal factories, dyeing works, cotton spinning and weaving, basket making, brass manufacture and ornamentation, &c. And remember that, thanks to one of our English chartered companies, this Kano, and these fine Hausa people—whose language has long been the key-tongue of all trade in Central Africa—are brought securely under the flag and influence of Great Britain. It is, from our point of view, a drawback that Kano lies at an unhealthy level, and its people defy every sanitary decency in their abattoir and cemetery arrangements, but that is their way of being happy. Katsena is much more salubrious, having 1,500 feet of elevation.

Ere long under British tutelage, and freed from dread of the Fulah slave-raider, the rascal who raids his own people for the mere joy of it, freed from this curse, the Hausa States will rise to pre-eminence through the aptitude and capacity for discipline inherent in that virile people.

I must pass over Bornu and its great chief city of Kuka with but one or two pictures, but would like to dwell for a moment on the deeply interesting fact that here—in the Chartered State of British Nigretia—we tread upon the dust of empires. At the time of our Heptarchy this very Bornu was the seat of a Negro empire covering a million and a half square miles, and extending from the Niger to the Nile. And Sokoto and Gandu—our Treaty States—formed but a part of the Negro empire of Songhay, having its capital at Gogo on the Niger, and extending westward and northward as far as the Atlantic and Morocco.

A Journey in Western China.—Mr. A. von Rosthorn, a member of the commission appointed to open the port of Chungking to foreign trade (1891), describes, in a paper read before the Geographical Society of Vienna, a journey which he made in the autumn of the same year, partly over new ground, in the north-west of the province of Szu-chuan. He proceeded from Chungking to Chengtu-fu by the usual route, and thence to Kwan-hsien, at the head of the irrigation works by which the waters of the Min are distributed over the plain of Chengtu-fu. Kwan-hsien was visited by Captain Gill in 1877, when he made what he called a loop in the mountains to the north of the Chengtu-fu plain, as to which he gave out the conjecture that it was formerly the bed of a lake. On this point, according to Von Rosthorn, tradition and history leave no room for doubt. Von Rosthorn first points out that the bifurcation of the Min at Kwan-hsien is clearly artificial. Traditionally, the plain of Chengtu-fu is said to have been at one time a *lu-hai*, which, says Von Rosthorn, can only mean a lake or a swamp. And, further, the Chinese annals of the period of the Chiu, the period in which these annals begin to be trustworthy, ascribe the origin of the works by which this lake or swamp was drained to one Li Ping, the first governor of Shu, who entered on his office about 250 B.C. The irrigated plain of Chengtu-fu would thus be, at least, in part upwards of 2,000 years old. At Kwan-hsien the new part of Von Rosthorn's journey began, his route being from this point for the most part westerly. The new ground traversed lies to the north-west of a line drawn from Kwan-hsien to Tachien-lu and south of $31^{\circ} 40'$. Most of this region forms the administrative district of Chinchuan, or Moukung, which is separated from that of Wenchuan on the east by the Palang-shang range (altitude of pass about 15,000 feet). The district of Chinchuan is composed of the basin of the river of that name—a Chinese name, meaning "gold-stream," for the upper part of the Tung, or Tatu-ho, known to the tribes of the district as the Chaichu-ho, or the Tsuchin (see map in Proceedings R.G.S., 1886, p. 416; and Baber, "Travels and Researches," p. 94). The whole region is composed of mountain ranges with narrow intervening valleys. The prevailing rock is granite, which appears on the surface chiefly in the higher parts; the sides of the valleys, and above all the main valleys, which have a north-to-south trend, being formed principally by precipitous slate formations, which leave little room for cultivation at their base. The native tribes, Tibetan Lamaists, are chiefly found in the side valleys and on the higher parts of the mountains, where they cultivate barley, wheat, and buckwheat up to the height of 12,000 feet. Until the latter part of last century, these tribes were under the rule of independent chiefs; but in 1776 they were conquered by the Chinese, after a war of some years. The Chinese carry on the government in a conciliatory spirit, recognising the influence of the lamas, and making every effort to secure their favour. They have made many attempts to colonise the region, but with little success. Except in the military posts, which are established beside each of the great lamaseries, the Chinese are found principally as traders, innkeepers, and porters, and hence confined to the main routes in the sparsely inhabited main valleys. Von Rosthorn, it may be mentioned, rejects Baber's name of Hsifan (Sifan) for the tribes of this region, as not being current locally; but it may be pointed out that Baber suggests the name only as "occasionally used," and as having "no very depreciatory meaning" ("Travels and Researches," p. 93). The name generally used, according to Von Rosthorn, is Man-chia, or Man-jen, which, he says, is free from the objection to which the general term of contempt, Man-tse, applied by Chinese to native tribes generally, is liable, the offensiveness of the latter designation lying wholly in the determination.—*Proceedings of the Royal Geographical Society, February, 1896.*

THE WORK OF THE HAUSA ASSOCIATION.*

(See Map.)

By Rev. W. ROBINSON, The Hausa Student.

[Read to the Members, in the Library, Monday, October 12th, 1896.]

THREE years ago I had the privilege of reading a paper at the Nottingham meeting of the British Association on a journey to Central Africa which my companions and I were just about to undertake. I have been asked to-day to give some account of the country and people which we were then just about to visit. When we remember what rapid strides not only exploration but settlement by Europeans has made in Central Africa, it seems hard to believe that there should be a country so large, or so densely populated, as to contain at least one per cent of the population of the world, in which there is not at the present moment a single European resident. Nor is our wonder lessened when we realise that these millions of people are in theory, and will soon be in something more than theory, our own fellow subjects. Hausaland, the country to which I refer, forms part of what should, strictly speaking, be called the "Central Soudan." The word Soudan, which means simply the black country, *i.e.* the country of the blacks, is applied by the natives themselves to the whole of the vast region south of the Great Sahara and north of the equator, stretching from the River Nile on the east to the Atlantic Ocean on the west. The Hausa States, which occupy about the centre of this district, extend, roughly speaking, from lat. 8 to 14 N., and from long. 4 to 11 E. They include an area of about half a million square miles.

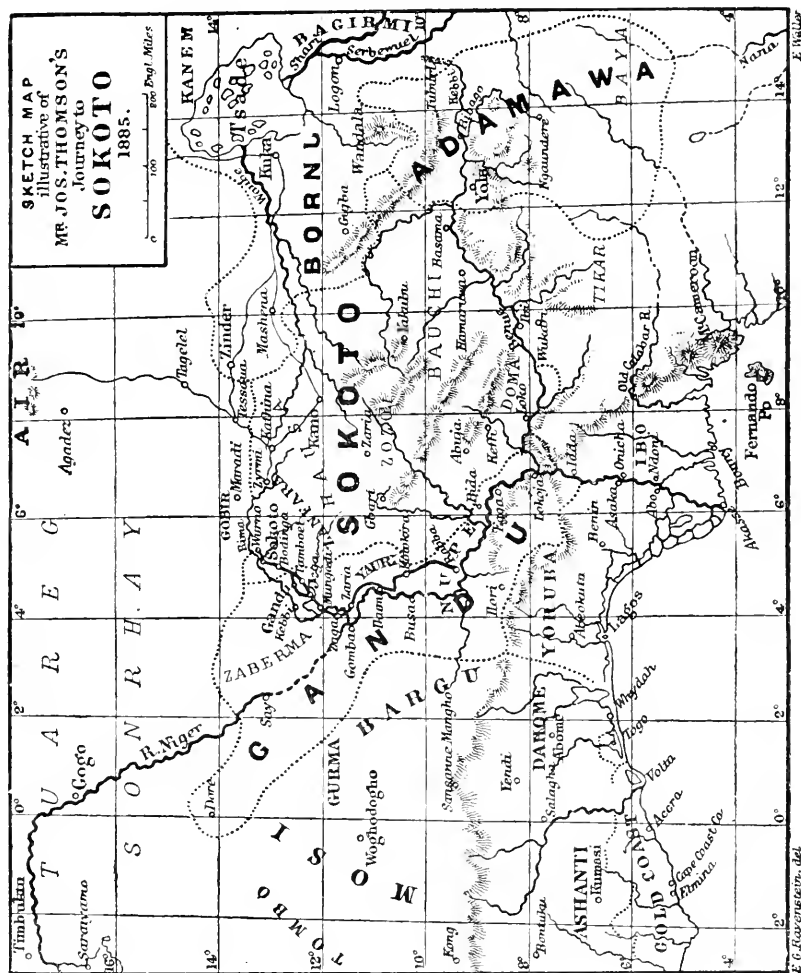
I should like to arrange what I have to say to-day under three very simple heads—"The country," "The people," and "The language of the Hausa people."

The reason why the Hausa country has remained for so long comparatively unknown is that it is cut off from the sea, and therefore from intercourse with Europeans, on the one side by 1,800 miles of almost waterless desert, and on the other side by 300 or 400 miles of unhealthy country, a considerable portion of which is composed of malarial swamps. Until the discovery of the mouth of the River Niger, an event which took place within the lifetime of men still living, to approach the Hausa country from the West Coast was almost impossible.

It was in the hope of avoiding the wide malarial belt on the West Coast altogether that my companions and I went out in the first instance to Tripoli and Tunis, in order to study the Hausa language amongst the natives to be found there, and at the same time to make enquiries as to the possibility of crossing the Sahara. There are two regular caravan routes across the Great Desert which are traversed every year by native caravans. The one goes from Tripoli *via* Murzuk, and thence directly south to Lake Chad; the other starts from Tunis and goes *via* Ghadamis and Ashen to Zinder, and thence either to Kano, the capital of the Hausa States, or to Lake Chad. We eventually discovered that both of these routes were practically closed to Europeans. The Turks prohibit any European from passing through the province of

* Paper read at British Association Liverpool Meeting.

Tripoli in order to reach the former route; the French, at the time that I was in Tunis, refused to allow any Englishman to pass through the southern portion of the province of Tunis in order to reach the latter. Soon after I left they attempted to send an expedition under the Count de Moré to Ghadamis, which has unfortunately met with disaster, the party having been massacred by the natives. When we even-



tually reached Kano, at the south of the desert, and attempted to cross from south to north, we were told that the hostility of the desert tribes to Europeans was so great that they had recently murdered some light-coloured Arabs who had attempted to cross, on the suspicion that they might be Christians in disguise. A letter, which we sent across by native messenger from Kano, reached England in 93 days; the messenger, on delivering the letter to the English consul in Tripoli, stated that he

had been detained for a month at Ghadamis. If this were so, he must have ridden about 35 miles a day on an average the whole of the remaining time.

After spending about a year in North Africa we went out to the River Niger and ascended it for 300 miles to Lokoja. We then ascended the River Binue, a tributary of the Niger, for 100 miles to a village called Loko. Where we left the River Binue, at a point 400 miles distant from the sea, the river was about half a mile in width. It is navigable for small steamers about 500 miles above Loko.

Loko itself, though 400 miles from the sea, is only 425ft. above sea level. As the question of elevation is one of considerable interest in view of the possibility of Europeans attempting to settle in this country, it is perhaps worth while giving one or two of the observations for elevation which we were able to make. A hundred miles due north of Loko is the town of Kaffi, which contains 15,000 to 20,000 inhabitants; its altitude is just a thousand feet. On leaving Kaffi in a northerly direction the ground begins rapidly to rise, till about a hundred miles further north it attains an altitude, at a place called Katill, of 2,530ft. above sea level. This is the highest point we passed in the course of our journey, and, with the exception of a few isolated points, is the highest anywhere in Hausaland. North of Katill the ground gradually declines, Zaria, 50 miles north of Katill and 250 miles north of Loko, being just over 2,000ft. From Zaria to Kano the country continues to decline, the level of Kano being 1,699ft. This last represents the elevation of a very large district for many miles round Kano. If it be the case, as is often assumed, that an altitude of 5,000ft. is a necessary condition for the establishment of any permanent European settlement in Tropical Africa, it follows that Hausaland can never become an English colony, though, at the same time, there is no reason why it should not be exploited and inhabited by Englishmen to the same extent as India is now.

Passing on from the country to the people, the Hausa-speaking population has been estimated by the few European travellers who have visited the country at about 15,000,000, and, though such an estimate must necessarily be extremely rough, it is probably as good as any we could suggest. Every day during our march we passed two or more villages of considerable size, and about every fifty miles we came across a town containing from 10,000 to 30,000 inhabitants. The political capital of the whole country is Sokoto, situated in the north-western corner of Hausaland. The commercial capital, and by far the most important town, is Kano. The market of Kano is probably the largest which the world contains. Col. Monteil, who visited it four years ago, estimated the daily attendance at the market at from 25,000 to 30,000, and from what we saw the estimate does not appear to be much, if at all, above the mark. The population of Kano is about 120,000. The majority of the inhabitants are engaged in the manufacture of cloth, and if their native literature is to be relied on, they have been so engaged for 950 years past. The cloth is woven from native-grown cotton, and most of it is dyed with indigo also grown on the spot. As Col. Monteil says, Kano-made cloth clothes at least half the population of the Central Soudan.

Another principal article of trade in the Kano market is what is known in England as the kola nut "*sterculia acuminata*." It is of a brick-red colour and about the size of a large chestnut, and has a peculiarly bitter taste. It is imported in immense quantities into Hausaland from the country which lies to the back of the Gold Coast. The natives believe that it keeps off the pangs of hunger and enables them to work for long periods without food. The fact that for generations past it has been eagerly sought after by rich and poor alike, and that they will constantly spend the last cowries they possess in buying one to chew, seems clearly to prove that it is something more than a mere luxury.

The Hausa native is perfectly black, but he does not possess such thick lips or such curly hair as we are accustomed to associate with the ordinary negro. He is by nature a trader rather than a soldier, though, as experience has shown, when trained by English officers he makes probably the best soldier to be found on the African continent. To anyone who has not had actual experience of Hausas the weights which they are accustomed to carry as porters would sound almost incredible. The ordinary load carried by our porters was ninety pounds, and during one stage of a hundred miles half a dozen of them voluntarily carried two loads apiece, *i.e.*, a load of a hundred and eighty pounds.

The Hausa language has special claims upon our attention from the fact that it is probably the most spoken language in Africa. Its only rivals, from the point of view of numbers speaking the language, are Swahili and Arabic, but, though either of these might claim to be understood over an almost equal area, neither is probably spoken by 15,000,000 people, the number, that is, who are believed to speak Hausa within Hausaland itself. Looking forward, moreover, into the not very distant future, four languages, and four only, will dominate the whole of the African continent; these are English, Arabic, Swahili, and Hausa. English will be the language of the south, Arabic will be the language of the north, while Swahili and Hausa will be the languages of eastern and western Tropical Africa. In regard to the connection existing between Hausa and other languages, it would seem to be probably connected, not directly with Arabic or any Semitic language, but rather with the group to which Coptic and Berber are supposed to belong. It has been suggested that this at present ill-defined group represents an earlier stream of immigration into Africa than the Semitic, and that the resemblance between the grammatical structure of the two points to that prehistoric time when both races, or groups of races, inhabited a common Asiatic home. Should this theory ever be established, the interest from the philologist's point of view attaching to the study of what may perhaps prove to be the most important representative of this group can scarcely be overestimated. Hausa has been reduced to writing for a century, and possibly very much longer. According to their history, now obtainable in a written form, Kano has been occupied by the Hausas for very nearly a thousand years. Prior to this the Hausas were collected to the north of Kano, and to the south of the Great Desert. According to their tradition they had previously come, in much earlier time, from the very far East away beyond Mecca. For those who are interested in the study of native African languages, I may mention that the Cambridge University Press have published, within the last fortnight, a volume entitled "*Specimens of Hausa Literature*," consisting of the manuscripts which we brought back with us reproduced by photography in facsimile, with translation, transliteration, and notes. It is greatly hoped that an appeal which the Hausa Association is now making, with a view to establish at Tripoli a permanent centre for the study of the Hausa language and the training of Hausa natives, may enable further work of a similar kind, and more especially the publication of a grammar and a dictionary, to be attempted.

The one overshadowing evil of Hausaland, the whole of which is within the sphere of British influence, is the existence of slave-raiding. One out of every three hundred people now living in the world is a Hausa-speaking slave. There is no tract of equal size in Africa, or probably in the world, where the slave trade at the present moment is flourishing to so great an extent, or so entirely unchecked by European influence. The great majority of the slaves are obtained, not from foreign or outside sources, but from villages or towns, the inhabitants of which are of the same race and tribe as their captors. The practical result of this is that the country is subject to nearly all the evils of a perpetual civil war. There is no real security for life or property any-

where. At any moment the king in whose territory any town or village lies may receive a message from the king to whom he is himself tributary, ordering him to send at once a given number of slaves, on pain of having his own town raided. He thereupon selects some place within his own territory, and, without perhaps the shadow of an excuse, proceeds to attack it and to carry off its inhabitants as slaves. The attack is usually made in overwhelming numbers so as to prevent any serious resistance. Any who attempt to resist are massacred on the spot; the rest are made to march in fetters to the town of their captors, whence they are passed on to some central slave-market, or kept for awhile in order to be included in the annual tribute payable to the Sultan of Sokoto.

During the course of our march from Loko to Egga, *via* Kano, we had frequent opportunities of seeing the evil caused by slave-raiding. Soon after leaving Loko we entered the town of Nassarawa, where we were compelled to wait till the return of the king from a slave-raid on which he was then absent. On reaching a village a few miles further on, which bore the euphonious name of Jimbambororo, we were told that its king was not feeling sweet, owing to the fact that twenty of his subjects had that very morning been seized as slaves by the people of the adjacent town. On leaving this village we passed a spot where, two days before, fifteen native merchants had been carried off as slaves. On arriving at the town of Zaria, in the market-place of which we saw about two hundred slaves exposed for sale, we were once again informed that the king was absent on a slave-raiding expedition. During our stay in Kano, in the market-place of which five hundred slaves are always on sale, one thousand were brought in as the result of such an expedition. In the course of our march from Kano to Bida we passed towns and villages, literally without number, which had been recently destroyed and their inhabitants sold as slaves, and this not by any foreign invader, but by the king in whose territory the places themselves were situated. Slaves are used in the country for two distinct purposes—first as currency where any large amount is involved, and secondly as carriers. Every town in the Hausa States, which include an area of half a million square miles, pays an annual tribute, either directly or indirectly, to the Sultan of Sokoto. By far the greater part of this tribute is paid in slaves. The king of Adamawa, for example, we were informed, on what appeared credible authority, pays no less than ten thousand slaves as his annual tribute to Sokoto. The introduction of Mohammedanism, which took place at the beginning of this century, has, I believe, greatly increased the traffic in slaves, and therefore the raiding which is necessary in order to supply such traffic. In my recently published book, entitled "*Hausaland*," I have endeavoured to suggest the steps which it would be necessary to take in order to check and eventually to stop this slave-raiding. All that has been done up to the present to check it has been done by the Royal Niger Company without any direct assistance from the British Government. Without such assistance, however, it is impossible for any mere company to touch more than the fringe of the difficulty. What is wanted in the first instance is to enlighten the public generally as to the existence of the evil, and so to prepare the way for some action to be taken with a view to its suppression.

The task is indeed a great one, and not to be entered upon without careful preparation; but it is surely not too much to hope that what has been done on the East Coast may be done again on the West. Were the British Government prepared to spend on the West Coast half the money which it has spent on the East in the suppression of the slave trade, we might hope, within a comparatively short time, to see this stupendous evil removed, and to see the inestimable benefits of freedom and peace conferred upon the most interesting, and even now the most civilised nation in the whole of Tropical Africa.

UGANDA.

By the Rev. F. C. SMITH, B.A., F.L.S., F.R.G.S.

[Addressed to the Society in the Library, Wednesday, January 15th, 1896.]

WITH one or two bold strokes of description, by way of introduction, I will proceed to explain in detail some points of special interest in the life and circumstance of the people of Uganda and Busoga, which came under my notice during about two years spent amongst them.

Uganda is a land of hills and valleys, which run in close connection one with another from end to end. There are no wide plains anywhere within its borders; any approach to level ground may be described rather as *accidental* than characteristic.

Mengo is the present capital of the country, and is situated about midway between its eastern and western limits.

Eastward of Mengo the hills are flat-topped, a peculiarity worthy of attention, as most hills in that direction are miniature table-lands, upon which thousands of cattle were herded previous to the year 1890, when the dreaded and mysterious "nsotoka" (cattle-plague) swept them away as smoke before the wind.

Westward the hills are conical or undulating, with scarcely a flat-topped representative, while everywhere—north, south, east, and west—is the inevitable marsh, a natural consequence of drainage from the hills, where little outlet exists and rains are constant.

The storms which sweep over this region are wild and fierce beyond description, the lightning sometimes resembling sheets of flame, at others having the appearance of balls of fire, while the most common type is forked, and seeming to divide the heavens asunder with dazzling brilliancy. The thunder also seems to outdo any of Nature's efforts within temperate zones, for there, any and every conceivable magnitude of explosive sound seems to be reached upon some occasions.

Bishop Tucker's party (with the ladies) had a curious experience during their recent journey, for when they encountered a severe storm eleven of the porters appeared to be paralysed by it, and simply laid themselves down and died. The hailstones were very large—"great junks of ice."

Upon the slopes of the hills already referred to, bananas are planted, and yield an enormous crop compared with the labour expended. There are many kinds, some forming the staple food of the rich people—*i.e.*, when cooked, as we do English potatoes, for instance, which they resemble in flavour, &c.; others are reserved for beer-making, and while some are good for dessert, others are never fit for that purpose. The bananas, as already pointed out, are almost exclusively cultivated for the higher ranks of natives, but the poor people (bakopi) have to be content with sweet potatoes as their regular diet, with little to modify its monotony.

The method of reproducing sweet potatoes is interesting; parts of the potato itself are never placed in the ground, as gardeners are accustomed to do in England; the natives laugh if you attempt such a ridiculous plan. The Uganda custom is to take cuttings of the green which trails ivy-fashion over the soil; these are stuck in at a favourable opportunity, *i.e.*, when there is promise of rain, and these miserable, shrunk, vegetable tippets are not only expected to, but do indeed produce as prolific a crop of tubers as any potato plot in England. There is "blight" to vex the people, but its history differs from our own potato disease, for countless caterpillars devour the leaves, and so the mischief is begun until it affects all parts of the plant.

In dealing with the physical features of the land, it may be well to mention the contrast which exists between Busoga and Uganda. The former country is crowded with trees, many of them very fine ("magnificent" is my term for them), so that the land is nowhere open unless it is along the ridge of beautiful hills which overlook Napoleon Channel. Now, this is totally opposed to the features of Uganda, a country which is strikingly "open," the valleys being the only localities where trees so abound as to seem to try to choke one another. Again, while in Busoga there are some nasty marshes, there are few so tiresome as most of those which are in the way of any one travelling from east to west of Uganda. I cannot refrain from an attempt to describe the difficulty occasioned by these treacherous, stagnant barriers which intersect the land everywhere. I was going towards Budu, and arrived at the very edge of a belt of (apparently) meadow land. Its appearance was unusual, yet I for one thought this appearance in our favour, and therefore advanced cheerily, only doubting about what might befall the donkey which constantly shared my travels everywhere. We expected to slip, but nothing more. Not ten yards of the ground had been covered ere I was struggling between a feeling of dismay and boisterous laughter, for I found we were sinking slowly, slowly, yet surely, surely, as each step was taken. For ourselves (*i.e.*,

I and my native attendants) we cared comparatively little, because we could grab at papyrus and other marsh plants, and check the tendency to sink; but, alas! for us, the *ass refused to budge*, and even until now I am debating in my mind about the intelligence of that singularly frisky specimen of his kind. In vain did we coax, or goad, or pull, or push, it availed nothing, and "Tommy" just rolled over on to his side, closed his eyes, and feigned death. The absurdity of the situation made us squeal with laughter—"squeal," because we thought we ought to be angry, as we were kicking about in the dense marsh weeds, only to find that the more we struggled the more we became entangled. Partly swimming, and partly endeavouring to stand, we at length, after hard work, released the donkey from its saddle gear, but found to our dismay that now we could neither advance nor retire. We were fairly entrapped in this quagmire, and the more we struggled to get the donkey's co-operation the more it seemed like a dying or dead animal. I made a quick decision, which resolved itself into a plunge amidst the mud, weeds, and water, until I was able to scramble to the opposite bank and *terra firma*, where a hasty explanation elicited the willing assistance of a resident chief. All the villagers were summoned, and went off in a body, soon to return with a most woe-begone, mud-covered quadruped, the delinquent of a queer procession.

Not long after my return to England I was innocently asked when donkeys were first introduced into Uganda. Instantly I replied, "Oh, when *I* first went there," and then wondered why they laughed. You will understand the real meaning of my answer, but I've often thought that "Tommy" used to bray "One donkey makes many," and perhaps he was a truthful although mischievous animal. Reverting to the marshes, I ought to point out that in rare instances it has taken me fully one hour to cross a marsh, although pressing forward without cessation, at the same time giving out all the strength I was capable of expending. Again, an unenviable experience has been that of being poised on the shoulders of a man who threatens to fall every yard, abuses if he does not curse your heavy weight, and talks of dropping you into the slush as he is "without strength," while he becomes a sort of greasy-pole with the effect of exertion. What, then, shall we say which shall be relative to this distinctive feature—the marsh beds? I think this, that in considering them—apart from the hills—we should be disposed to describe the land as an *unhealthy* one; but recollecting the extent of the hills, we quite emphatically claim the country as one of rare salubrity, especially as a tropical region. Further, when the marshes are cleared of the teeming vegetable rubbish—papyrus, reeds, &c.—they will become a source of wealth to the land, and yield cotton, cereals,

coffee, sugar, &c., so that we may be quite certain that bye-and-bye these marshes will prove the great prize of Uganda's annexation. We have a rough diamond, which it is our business to polish carefully.

Fix, then, your minds upon the words "hill" and "marsh," and I shall have succeeded in impressing upon you two primary strokes of description in regard to Uganda (and Busoga). All the region about the north of the Victoria Nyanza is to be thought of as one of life to repletion; night or day, wet season or dry, the land abounds with life—fleas, mosquitoes, fireflies, snakes, fish, reptiles, birds, rats—and, while this looks repelling, it is easily possible to plant yourself down quite apart from these and a myriad other creatures. Some regions of Africa appear to be stripped of life; death stamps them.

On landing in 1890, after having spent nearly a month crossing the Victoria Nyanza, our attention was arrested by the unusual vivacity of the people when compared with what we knew of other negro races. In course of time we found, too, that "life" seemed the index to everything; leopards, hyænas, antelopes, elephants, and smaller animals make an aggregate of countless hundreds roaming over the land.

In the long grass snakes *swarm*, if we may judge by the numbers seen lying dead in or by the pathways (curiously, I rarely saw them alive). Insects, as already pointed out, are around you (not on the hill-tops) in such myriads that the humming sound of mosquitoes at once suggests the thought of a threshing machine, and sleep is impossible. I have seen a comrade's pillow smeared with blood, owing to the ceaseless attacks of these pitiless insects during an hour or two of fitful sleep, and nothing can exceed the vividness of impression on the mind caused by these times of wakeful nightmare. Beyond this, an idea of the profusion of life is gained from the knowledge of gnats' existence in such clouds, that the natives collect them (how, I have not learned), place them under pressure, and use them, when in the form of cake, for food. As the fall of water and spray from the column of a tall fountain so these creatures appear—rising, tumbling, plunging, as if moved by force from beneath.

Ants of many kinds teem in all directions. Termites, or white ants, seem to be ubiquitous in a far more literal sense than that in which we use the word. If you carelessly place down a book in any place, you will quickly conclude that white ants are *everywhere*, and you must not be careless a second time.

We were apt to say that the dwellings of the termites were the only substantial ones in the land; they (the termites) seemed to pull ours down, yet ever to strengthen their own by adding soil cemented with a viscous secretion, which made

their hillocks, some 5ft. to 10ft. in height, "hard as iron." The air seems to oxidise the soil, so that all the mounds are rust-coloured, no matter what the surrounding soil is like.

South of the lake we do not see these hillocks until we approach the coast, intimating a local distribution of these useful, yet very troublesome, creatures.

It is interesting to know how these termites are captured and used. After a shower of rain, and during the hour or so preceding sunset, groups of children may be seen squatting in the roadways, or at the base of the mounds referred to as being their dwelling places. If the roadway, boys and girls will be seen stuffing their mouths with *live* ants as they come up through small holes from the subterranean galleries below in a way that reminds one of smoke. These are the times when a certain section of the colony flies from earth heavenward. If it is the mounds which have been watched, it will have been noticed that on the signs of rain approaching banana leaves are carefully laid over a light framework of wood which spans the mound, and also over a small pit at its base; then, when the rain has softened the soil's surface, up come the insects, only to find themselves imprisoned beneath the overlapping leaves, while the glad native, thrusting in his hand, either proceeds thence to cram his mouth from the living mass, or, taking his victims away after frizzling, stores them, unless he takes them away for sale or exchange in the market place.

I now turn to the birds. Few countries in the world, of similar area, can boast a more extensive aggregate of birds than this equatorial region, and this side of life I want so to present to you that you may feel a peculiar interest in it.

As formerly (before baptisms were so general) the children of Uganda used to acquire a name as the result of some personal peculiarity, or some fancy of its foster parents, so birds seem to have derived their names. This at once leads us to certain details of bird life.

As a conspicuous instance, I take the glossy Ibis which abounds in Uganda, going forth at early morning to its feeding grounds by the lake shore, and returning at nightfall with unchanging regularity to the same clump of trees, and very likely to the same branch. On alighting it says with great distinctness—Mpabaana. This, in Luganda (the prefix "lu" signifies "the language of"), means, "Give me my children;" and as you hear the cry repeated, again and again, you think how really interesting is the story current amongst the people. They tell that long ago (eda=once upon a time) a glossy Ibis left its nest and young for the purpose of finding food, and on its return found its offspring had been taken away. Soon it discovered that the family had been removed by a woman who was anxious to supply a meal for her children, and even whilst

the parent bird was returning homeward the youngsters were cooking in a pot nigh the very tree where they had been reared. At once there was a piteous scream—"Mpabaana! Mpabaana! Mpabaana! give me (back) my children," and from that day to this these birds are regarded as appealing for the restoration of those fledglings. Hence the story, the cry, and the name by which the bird is known are closely connected.

The Golden Cuckoo is another bird worthy of special notice, both on account of its plumage and its cry—"Kirimululu, Kirimululu," repeated shrilly and clearly as it dashes about in swift flight among the banana plants. I have been told by Waganda ("Wa" signifies "the people of") that its cry may certainly be interpreted into "Nze nfe mpeo," *i.e.*, "I am dying of cold;" but why the bird is supposed to say it is dying of cold I have never learned, yet as I write now it occurs to me that there is a natural connection between the cry and a haste to make itself warm by exercise.

The other species of Cuckoo (one very much like our English species, only having richer tints) is to me more full of interest than the last. Its cry is Sekoko, pronounced deliberately "Se-ko-ko." The bird attracts attention chiefly from the fact that it sits on the summit of some tree during a full moonlight night and cries in staccato measure, "Se-ko-ko," until you almost hate the sound. Once—and only once—a specimen would so persistently occupy a tree, and all night call out very near my sleeping room, at a time when I felt restless and unwell, that I was constrained to shoot it, even though I felt a strong feeling of repugnance to the act. As well might one shoot nightingales or thrushes for singing too much. In this connection I wish to refer to the effect of the bright moonlight upon other living objects, *viz.*, men, who are, I believe, certainly affected for harm if they sleep with the moon's light beaming full upon them; in fact, they may be moon-struck. I have no strong evidence to give, but assert this much from testimony given in Africa. I refer, of course, only to equatorial regions, where the moonbeams seem much more bright than here in the temperate zone, and where even birds seem puzzled as to whether it is day or night. For an example of this we may take the colony of crows at Mengo, which used invariably at the time of the full moon to leave their roost-tree in the market-place, fly around and around in circles, utter their cawing cry, and, after some fuss, settle down again.

You would scarcely expect to find House Sparrows in Central Africa amid tropical surroundings, yet undoubtedly there is a first cousin of our own impudent citizens, only far more shy, and almost as dumb as a fish—its chirp, chirp being a subdued resemblance to that of *Passer domesticus* (Eng. H. Sparrow), and only noticed by persons on the look-out for fresh know-

ledge. It builds in *eaves* of houses now, but what did it do when all huts and houses were circular? I cannot go into other affinities. Some one will, perhaps, watch and mark a development of cheekiness in this bird with the onward march of civilisation.

Hérons (Jack Hernes) are very common in Uganda, and a heronry is not hard to find; there was a large one behind the tomb of King Mutesa's mother. Wading birds are largely represented about the lake and need a chapter to themselves. The Wagtail (our "Dish-washer") is one of the most familiar of all native birds, and is so tame that it will cross the threshold of a house, and catch insects before you, until when disturbed it retires with studied leisure. There are several species, but the black-and-white one alone arrests the continuous attention of casual observers. Archdeacon Walker (I believe I am correct in citing his name) once had positive proof of a cuckoo (the Se-ko-ko) laying its egg in a wagtail's nest. This affords a key to much knowledge of the habits of two foremost birds.

Hornbills attract the attention of the dullest stranger, but I can only refer to one species called (in Uganda) Lukunyu Kunyu, or (in Busoga) Dulenke. It is a lanky bird, and seems in Uganda to be tongue-tied—seen but not heard, like some goody child. However, in Busoga it is far otherwise, and can be both seen and heard all day long, since there it alights on the topmost branch of the loftiest trees, raises its wings, bringing them up to right angles with the body, strikes them upward and downward, and at the same time begins to cry aloud. First it is a note of distress, as if desiring to call your attention to its misery; then a cry of pain and despair is uttered, until finally the cry, the motion, and the bird collapse together, as if what you see and hear is marking a death struggle.

The anatomy of this species is singular, for lying beneath the skin are cells which no doubt expand and contract according to the combination of cry and attitude just now described. No doubt it is pleasure, even ecstasy, to the bird, but from me it has evoked always compassion, pity, and a desire to comfort the poor thing.

On May 10th, 1892, I was on the island of Burungugwe, and whilst compelled to wait there, with nothing else to do, I strolled around its edge and sought for plants and insects. Orchids are common there, and after examining and sketching some—two species—I came into an open glade where my boy attendant called attention to a snake passing near my feet. I said it was harmless; he declared it was deadly; so we cried quits by my action in cutting off its head with the muzzle of my gun. I saw it (the muzzle) would be filled with sand, by the pressure from my shoulders thrusting it into the sandy soil, so quite carefully I raised the gun-stock upwards and cleansed the barrels with a

finger, sloped arms, and trudged on my way thinking over the abhorrence the Waganda have for all snakes, since they believe *all* are poisonous (except pythons). I had lightly laughed on this occasion, because I felt with the boy who stood beside me that this was the finale of a really venomous reptile; whereas sometimes I had taken a snake fearlessly in my hand, while certain spectators would show open-mouthed astonishment at my temerity, but to the practised eye this sort of conduct does not require much courage, although at all times I have been careful in my preliminary observations and subsequent handling of any serpent.

To return to the incident itself. I had not gone far when I saw a magnificent sea-eagle, which I had long desired to get hold of, since it was either new to science or very rare in national collections. I failed to get within range, and so once again trudged forward until I saw a group of swallows and martins on a patch of damp sand in the narrow pathway. I halted, *carefully* aimed, fired, and for a second or two felt confused, then I saw that not one bird of the dozen or eighteen clustered together had been killed. Quickly I discovered the cause to be due to the bursting of the barrel from its having been choked with sand. Part of the muzzle was torn away, but beyond a severe bruising of the shoulder nothing worse happened.

In this branch of study we must remember the vultures, for they are seen everywhere and are almost as tame as fowls, more useful than borough scavengers, and too disgusting for minute description; yet they often provide the best of fun, for when an animal is slaughtered they come from some out-of-sight distance, followed by others and still others, swirl around, alight on some neighbouring tree or the ground, and with the silence of judges watch the proceedings; or, if watching has too long to be sustained, they do not fear to approach and grab at any outlying morsel. But let a piece of tough and lengthy offal be thrown out, and at once there is a contest, which constantly takes the form of two competitors who go through exactly the circumstances of an English tug-of-war game, with the only difference of anger for mirth.

An irritated vulture will strike an attitude of defiance, with head and neck blushing scarlet or crimson, doing a swear meanwhile, yet proving itself in the end a craven coward.

An "eagle" of great interest (*Spitzæetus occipitalis*) is called "Wonzi Wonzi" by the natives, and is taken advantage of by the children, who tease it by shouting "Wonzi Wonzi." Whenever done, this fine bird erects its conspicuous crest (which is some three inches in height), hops around on its standing-place, and seems to say—"Yes, I am listening. What do you want?"

I allude to but one more bird, and then will change my topic.

Throughout the land north of the Victoria Nyanza there are many sorts of pigeons and doves. One of the latter serves to illustrate the better side of native character. By name "Kamukulu," this bird is regarded very much as we regard the robin. An order was once issued throughout Uganda that it should be unmolested. The edict was given to me in these terms: "Abakulu bwebagamba nti, Kakana, temukalya kagakubatta, tekari bwa"—meaning, in effect, that it was the chiefs' orders that these birds should not be killed or eaten.

Crowned cranes, plovers, hawks, gulls, pelicans, parrots, and a host of small birds attract everybody's attention. Few of these are fit for food; in fact, guinea-fowl are the only birds we take trouble about. In shooting these birds I had several amusing experiences—among the best was when I was living in Busoga towards the end of 1892. Nausea had seized me with the monotony of goat's flesh and bananas, when the cry, "Go back! go back!" fell pleasantly on my ears one quiet evening. I sallied forth, and spent some time in vainly hunting for the birds which I had certainly heard. In great disappointment I felt forced to return homeward, when I caught sight of a moving head, and in less time than it takes to tell I had killed two plump guinea-fowl. With a light heart I carried my heavy game, and sped swiftly over the rough ground, until my attention was arrested by a strange cry in the bushes which grew chokingly about the trees to my right hand. At once, allured by curiosity, I struck off the path at 45°, marked a bush with great care, dropped the brace of birds, and passed on with both hands free for an emergency. Expecting—for it was getting dusk—to obtain a large owl, my luck only gave me one more guinea-fowl. Not so bad, thought I, to shoot three so quickly; and, as the dusk was deepening into darkness, I made straight for the path, like "markers out," and took a bee-line for the bush; but, alas! for me, I learned the old proverb in a new way—"A bird in the hand is worth two in the bush."

Basoga had been watching me, seized their opportunity and snatched my game, got a good supper, and most likely a good wiggling the next day. Anyhow, I reported the theft to Luba's son (Luba, the chief who carried out Mwanga's order to kill Bishop Hannington), and was given a goat to cover the loss. So all's well that ends well.

RATS AND ELEPHANTS IN CENTRAL AFRICA.

BY THE REV. F. C. SMITH, B.A., F.L.S., F.R.G.S.

RATS ! RATS ! is the cry of those who wish to excite the activity of terriers and other small dogs in England. In Uganda there are more species (varieties) of rats than we can claim to have : one kind is in colour the same as a good dark silver-grey rabbit, another kind is striped in the direction of from head-to-tail with buff-coloured lines, while others are more like our own house rats. All these are small and come under the native name of "Mese." Mese ! Mese ! is not so emphatic as Rats ! Rats ! and I scarcely think that any of all the mongrel dogs which inhabit Uganda and Busoga know much about the sharp practice ours could teach them.

Our kind of rat, however, attracts attention in several ways. It is regularly hunted by men who take nets and, after arranging these around and over a piece of scrub, bary the rat or rats into its meshes, the rat being followed by dogs, which carry around the neck jingling bells of native make. When captured the animal is found to be fierce, and glad to use its large teeth with vicious quickness. It may be clubbed at once, or put alive into a basket, and if you could have asked for one in our day (1890-93) they were common enough, and your surprise would have been excited on seeing the rat large enough for most of our small dogs to less than equal its size. This creature—the Musu—is good to eat, and stands in a Muganda's estimation as one of his very best delicacies. I first tasted it in Budu—the extreme western province of Uganda. Previous to this I had been told by Archdeacon Walker that it was to him a reminder of our English pork, and as pork was a kind of food we only tasted about once a year in Africa, my appetite was keen. I found that the animal was not skinned, but skin and all enveloped in clay, and then when baked the clay peeled off. Word had been sent from Archdeacon Walker that I was very keen on tasting the flesh of the Musu, and so it happened that it was presented to me at well nigh every stopping place within the next hundred miles of marching, until at last I said : "Enyama eno enemye" (lit., this meat beats me). That is, as we should express it : I can't manage this meat.

Quadrupeds in Uganda are not so varied as in other parts of Africa which I know, yet still we have many kinds. Lions are found in a few places. Certain kinds of antelope are met with all over the country, and in Budu I have passed over a plain where those of one kind stand and look at you by hundreds without any concern or excitement. These antelope (there are no deer in Africa) are good eating, and relieve the monotony of goat's flesh, bananas, and sweet potatoes.

Elephants are sometimes seen ; a single animal was the first I ever saw wild. We had crossed the Ripon Falls, and passing on our first day's march through Busoga I had detached myself a little from the few natives who were with me ; the ground was difficult to traverse, for we sometimes rushed through columns of smoke, or shrank from the crackling and flaming brushwood which some one had fired, while other parts of our way led us through open glades or heavy and dense masses of tall reed-grass, or around some great fallen tree. I had scarcely a thought for anything but leopards and snakes when I saw, about seventy yards to the right of our track, a regular "Jumbo," staring at the passing men. Conquered by curiosity and pleasure I forgot prudence, and without stick or stone began a shout and half-trot towards the giant, who stood defiant until my men ran back making a Kelelé, i.e., "kicking up a noise," and this both checked me and caused the elephant to stampede ; then I received a rebuke for my rashness as strong as servants could give a master.

Another time I was resting at a house in Chagwe (there are ten provinces in Uganda—this is the East as Buda is the West), when the chief came and asked if I would like an elephant hunt ?

"Oh, yes, an elephant hunt, certainly ; but where ?"

"Outside !"

"Outside—but how so ?"

"Oh, the men have seen a herd."

"Ah ! When shall we go ? Now !"

"No, no ! To-morrow."

"To-morrow ! To-morrow ! But they'll be gone."

"Oh, no; it's evening now, and they are safe to stay."

"All right; but, by the way, I've no gun, except for birds."

"Never mind; we've guns."

"Well, what time?"

"To-morrow, after breakfast."

"Thanks. Good-night."

"Good-night" ("Osuze bulungi," *i.e.*, may you sleep well).

In the morning we bustled out, and there, surely enough, we saw twenty elephants, with their tails towards the stumps of a clump of palm trees, and standing in the relation of position as spokes to the axle of a wheel.

Their tusks gleamed, and I fidgeted to handle a gun. I feared they would bolt without any one having a chance, especially as every one seemed to caution his comrade to be quiet, and thus they made a noise. Stealthily, and with gesticulations, they crept up to within long range; then, while I was wondering whether I shouldn't be shot by the incredible carelessness of the men with guns, I was warned to keep quiet in a clump of grass. This I did, and watched the animals, who soon set off at a hard run, and guns banged on all sides, with no more effect than that of increasing the speed of the runaways, and causing them to bellow and snort small clouds of dust into the air. Crestfallen, the hunters returned to me with scarce a word more than "Sebo mpayo" (Sir, there is nothing).

Another time, the Rev. R. P. Ashe, Archdeacon Walker, and I came with 10,000 men, women, and children from Budu to the capital town of the land (Mengo). We were crossing the River Katonga, and, being such a throng, disturbed a herd of elephants, who struck off at right angles to our course, plunged into the river channel, swam across, and disappeared in the distance, tossing up dust and water, as if angry with us.

This is all which the writer can tell of his own personal experience with live elephants, but there remains more to say about the tusks, which are so valuable. Once I slept on hundreds of pounds' worth without being told it was there. I was only asked to oblige by sleeping in that special place for about ten days or a fortnight, and I made a safe guess at the reason; it was no temptation for me to steal, and, moreover, that was practically impossible, but the people of Busoga were daring robbers, and would risk being shot if they knew where the wealth was placed, with a careless guard to give an opportunity. I've known the natives remove "cloth" from beneath the head of a sleeping woman without awaking her. To exhibit signs of extraneous property in public was a sure way of preparing a robbery upon your hut in Busoga. I "creep" again as I think of exciting moments with fearless thieves.

Ivory is collected; women are sold for it, and warfare occurs as part of the means of securing it. In course of time it is sold by chiefs to European or Arab traders, who form a caravan and bring it down to the coast, where it is sold by auction at Zanzibar or Mombasa. The weight of one tusk is sometimes too great for one strong man to carry, still a porter is very proud of being able to take a place in the forefront of 800 or 1,000 men by carrying one huge tusk.

When I first went to Busoga, the country where Bishop Hannington was killed, I travelled with a veteran missionary and nephew of the murdered Bishop. We both were the first to go, and I was the first white ever to live in Busoga. After one month's stay with me Mr. Gordon returned to Uganda, and I was left alone. On our first interview with the Chief Wakoli he was full of good humour and pleasure at our coming, but our motives did not agree. He wanted the prestige and support of white men, we wanted only to teach the Gospel. To emphasise his pleasure at our arrival a present was sent to us of one tusk each, each worth about £80 or so on the spot.

After an anxious consultation together we agreed to respectfully decline the gift, and risk the result. Wakoli was very angry, because, on the usual conditions of guestship, it was an insult, and as an announcement of independence.

Gordon explained that we would have nothing to do with financial transactions, for we simply asked for hospitality and freedom to teach. It was a bold measure on our part, and involved far more risk than you can realise, but I think, in after months, it made Wakoli trust me as he would not otherwise have done. Our Mission puzzled him, but, at any rate, we were not greedy, and on our side it kept us free from a charge of dividing our opportunity between teaching and grasping wealth.

"This one thing I do" has to be the motto of a modern apostle, if he is to succeed and be a blessing.

—From "*S. Mary Abbots (Kensington) Parish Magazine*," October, 1896.

BIRDS OF EASTERN EQUATORIAL AFRICA.

(VICTORIA NYANZA REGION.)

BY THE REV. F. C. SMITH, B.A., F.L.S., F.R.G.S.

PART I.

THE birds of Uganda and Busoga were such quiet, happy, unobtrusive friends of mine during my missionary career in Central Africa that I feel jubilant at the thought of being allowed to tell you about some of them—and some only, because the region of the Victoria Nyanza swarms with myriads of birds of very many species and families, so that to tell you of all, even of those which I myself observed, would fill a bulky volume.

First, I must speak about one general fact relating to the habits of birds there, “Early to bed and early to rise” you know (do please note that this is a good habit), and then detail shall follow.

The equator *line*—which, although you *feel*, you never see—runs through Uganda, and therefore the days and nights are always of equal length, and so it follows that the sun sets at 6 p.m., and rises at 6 a.m. This is important to notice in the following connection.

Shortly before sunrise, when the “rosy-fingered” dawn is breaking, all the groves of bananas, and the woods, and the marsh shrubs, thrill with one loud chorus of song; it is not hard to fancy a magic conductor who rises morning by morning, mouth by mouth, year by year, and manages this band of piping melody, which, beginning in sweet and low trills, then alternating in crescendo and diminuendo, swells into a big double-forte chorus and suddenly concludes with an odd abruptness as the sun mounts above the horizon. Quickly it is broad daylight, the music has ceased (it is a kind of “carriages at 6 a.m.” business), and our bonny feathered friends have dispersed for the sake of finding a breakfast of worms and insects.

Now for a brief insight into their habits and character, for while all sing their early morning praise to God—grace before meat—yet all are not uniform in character.

We shall find pugilists (armed), scavengers, and thieves; also some with shy or bold, noisy or quiet traits; some born acrobats, others dupes or sluggards; some are everlasting chatterboxes, others as dumb as toads.

Let us ignore science, as science has a strict order of arrangement, for the present, and take the cuckoo as our first example.

We all know this bird's peculiar cry, because it is so loud, and we all know it is migratory, that is, it changes its home in the autumn and scottles off to Algiers and the north coast of Africa for the winter. Thus far for our English friend, but in Uganda cuckoos are different, for

- (1.) They do not migrate, because there it is always summer.
- (2.) They vary slightly in colour, the African being of rather deeper and richer hue than the English cuckoo (*cuculus canorus*).
- (3.) They have a different cry.

This variation of cry is most interesting and may be tabulated in this way:—

Engli-h.

Uganda.

Cuckoo

(a) Se-ko-ko (Sekoko).

(b) Kirimululu; or, Nze nfe mpeo—I am dying of cold.

You see there are three cries referred to. Let us consider these. “Cuckoo” we hear every spring-time uttered very usually while the bird is flying, “on the wing” as we express it.

In Uganda the Sekoko perches on one of the topmost branches of a tree, just as a thrush or blackbird will do in England, and begins its full deliberate contralto note “Sekoko” (only seldom does it cry when in flight). I want you to compare these cries by removing the “se” and uttering Ko-Ko first, followed by Cook-Koo, and instantly I think you will see the relationship of language. Both agree in size, both in diet, both, almost, in plumage, both, I believe, in their fraudulent nesting habits, and perhaps the broadest distinction is in the voice. So we arrive at this conclusion, viz., that there are at least two kinds of cuckoo in the world, differing only as twins do.

You will now say, "But that isn't all!" I know there is the Kirimululu, a beautiful little bird with its upper plumage of green golden-sheen which glitters and flashes in the sun as the bird darts about like a swallow, with its clear shrill cry of "Kirimululu" rapidly repeated, which the natives translate to mean "nze nfe mpeo," meaning "I am dying of cold." Once I shot a specimen for the purpose of sending a skin to the South Kensington Museum; it had been clambering about the stems of a Muhogo plant; eagerly I rushed after the poor wounded creature which I took in my hand, and lo! it laid an egg. I felt like some horrid ogre as I watched this dying beauty and the warm egg in the open palm, being ill-satisfied with the certain knowledge I had thus gained of the egg-colouring and plumage of this small foreigner.

Another bird of great interest is called "Wouzi Wouzi" by the natives. It is a dark brown bird of prey as large as a raven, with a fine crest on the crown of its head and a magnificent yellow eye that for brilliancy and height of colour beats any human eye into fits.

This aristocrat soars aloft into the bright blue heaven, and comes down just to be snubbed by small boys because he is *too sensitive*. He perches either on the top of a lofty tree, or on the peak of the conical-shaped houses. Here he sits in solemn and lonely stateliness until some rude urchins shout out and jeer "Wouzi, Wouzi," then up flies the crest and around jumps his highness, seeming to say, "Hullo, my lads, did some one speak?" Then perhaps will follow a sort of dialogue between the dumb (bird) and the loquacious (youths).

Do you know the Redstart? a pretty summer visitant to England, yet in Uganda, there is a far prettier *cousin*; it seems as if a bit of heaven's blue had made a mistake and fixed itself on the back of every one of its kind.

Far different is a bird which inhabits the shallows all around the Victoria Nyanza. Scores or even hundreds stand in the water, and with their long legs they have nothing to hinder enjoyment and wade about, as you do with your "knickers" turned up. Often they flock so closely together that you could—if you wished—shoot six or eight with the contents of one cartridge.

Supposing you to have obtained a specimen, you would find by examination two points of unusual interest about it. First, you could see daylight between the upper and lower bill, and these would be lined inside with a rough arrangement like whalebone.

Now the birds feed on the mollusca (call them "winkles") which swarm in the marshes; these they take, and after removing cleverly all the shell as clean as a whistle, swallow the inside. On this account the natives call these birds, "Nkona masonka," i.e., the snail-breakers.

Secondly, we should find the shaft, or middle part of very many of the breast feathers expanded and hard like whalebone, and some of these suggesting curls. If you can get some one to show you the feathers of an Indian Jungle-fowl you will see something similar. I will only stay now to say that it is not far from the truth to speak of strange birds with feather nails (not finger-nails) and patent mouths.

If Mr. Editor will allow it I will by-and-by tell you the queer story of the Mpabaana and about the Ntuletule, the Nsega, and other birds.

PART II.

VERY sluggish are some African boys, yet few, if any, lack sympathy, if you can succeed in drawing it out. This is sometimes done by letting them talk away about birds and beasts.

Uganda lads are generally quick, and even have *kyc go*, or cheekiness, which makes them willing to do mischief, or relate a story. Here is one they tell about the Glossy Ibis, a bird about the size of a small fowl, which comes homeward night after night to certain trees, as rooks do in England, and cries out, *Mpa-baana*! This, in Lu-Ganda, means, "Give me (back) my children"; and boys delight to tell how that "once upon a time," "Eda," a good mother, lost her family by leaving the nest one day in search of food. Too long she remained away, for, on her return, she was shocked to find her wee children had vanished, yet soon she discovered their unhappy fate, for near by sat a woman who had heartlessly prepared the young nestlings, and now watched them in process of being cooked within a native earthen pot; at once the mother's heart was rent, and loud piteous cries of *mpa-baana*! *mpa-baana*! burst forth vehemently, although the anguish of her cry did no good, for her young ones were dead. *Bwegüyo*, or "So it happened," the boys tell you, long ago, yet, to this day, all the birds of the same kind go on crying out—"give me (back) my children!"

Very startling is it to hear this cry, as I have done. Once in Budu I crept beneath some bark-cloth trees, and waited for the twilight to deepen into night. All was hushed and still, until presently there came the sound of wings, a smothered cry, and the departing sound of birds half frightened. Soon they came back again, custom overcoming suspicion, and no sooner had two or three got foot-hold of the branches, than they began to cry, with vivid human utterance, Mpa-baana! mpa-baana! I could have jumped out of my boots if they had been loose enough. This ibis is not the only one found in Uganda, for although they have not the Scarlet Ibis—so called because it is entirely of a fine scarlet colour—yet the Sacred Ibis is found, and is remarkable for a curiosity which gave me a “turn” when I first saw it. Where the flesh is beneath the wings, there are no short feathers such as you will find in any bird you come across, but it is bare skin of blood colour, and you fancy blood vessels have gone wrong. The Sacred Ibis has pure white feathers; the Glossy Ibis has dark green silky plumage: both were regarded with great veneration by the ancient Egyptians, who kept them in their temples, and embalmed them after death.

Nearly all the birds about the Victoria Nyanza are called according to their cry, and now I am going to describe one named *Ntuletule*, pronounced by the plover itself, N-tu-let-oo-lay! only quite quickly and shrilly. Like our Lapwing, or common plover, it inhabits open plains (in Budu). The male bird is armed on each wing with a strong sharp spur, with which it fights with a vengeance—fighting for love, too, as that is the way he secures the exclusive affections of his modest lady sweetheart, by beating a rival off the field. Nor is this all; around the base of the beak is a bright yellow frill of skin, and, as if conscious of a principle that fine weapons make a fine bird, he runs nimbly ahead of you, flicks his tail as he stands on the summit of a low mound, cries with a shrill, boyish soprano, “Ntuletule!” and flits off again. Again, both he and his lady-love excite interest by their unconscious mimicry (*i.e.*, imitation) of surroundings, for the plumage is so like the ground on which it runs that they are not easy to see, and you may be induced to look out for them only because you hear their clear whistle.

The *Nsaga* is a totally different kind of bird to any you see in England (excepting, perhaps, when you go to Oxford or Cambridge). In science, the *Nsaga* belongs to a set called “gyps”: in English, “Vultures.” I shall here describe the African kind. It has a bare head and neck, lies at an immense height, going around in circles until the prospect of food attracts the attention of one; then, as if drawn by magnetic power, a crowd will come, and, if possible, fall to for a feast, but this immediate meal is not always ready, so prepare for fun.

These cumbersome things flap down on to the ground or some great branch of a tree, and try to advance and steal off, if it is an animal being slaughtered; of course this insolence is resented, and as the birds are most valuable scavengers, they are not killed; so, perhaps, their boldness is excused, but yet they may receive a sound whack. Impatiently they wheeze and squeal until some entrail or skin is tossed away, then follows a tug of war in which A and B vanquish the rest, and fume at each other, while their bare necks and heads blush crimson, hissing and gulping, the dainty food becomes dangerously strained until a Tay Bridge divides. A sits backward, and so does B (A × × B); hissings follow while you laugh and think of something like this, as muttered by the birds—“You good for nothing hussey, you, you, there, begone!!”

I am afraid of Mr. Editor, but he is kind, so I venture to take space for this. Away there, the Waganda have no Robin quite like ours, but, still, a soft, gentle bird takes its place exactly.

One day I was standing with Johana Mwirow, and a dove (Jiba), having brown plumage, came toddling in at the open door, walked calmly around the floor of the room, and then out again. Johana had beckoned me to keep perfectly quiet, and afterwards told how the *abakulu* (chiefs) had issued a general order to the people that it was neither to be killed nor eaten, but left with the same feeling we have about the robin redbreast.

Wagtails (the Dish-washer) are also very tame, and come quite often across the threshold, snap at the insects, seeming to say good-morning, how-do-you-do, and go out again. We shall never find humming birds there, but still one lovely creature, with a crown of glittering emerald green feathers and a gorgeous scarlet breast, may be seen any day amongst the banana-groves. Now, good-bye, or I shall want to take the train for Uganda to-morrow, and meet old forms and faces once again.

—From “Our Boys’ Magazine,” August and September, 1896.

LETTER FROM BISHOP HANLON, UGANDA.

[Read to the Members, in the Library, Monday, October 12, 1896.]

St. Peter's, N'Sambia, Mengo, Uganda,

June 18th, 1896.

DEAR MR. SOWERBUTTS,

Many thanks for the two *Journals*, October to December, 1894, and January to March, 1895, and two "Geography" circulars, all duly received. I have read the former *Journal* with much pleasure and deep interest; but have not yet found time to read much of the last containing Commissioner Bower's article, so beautifully and copiously illustrated, though strangely written.

Concerning East Equatorial Africa and Uganda, about which the Victorians have delivered so many lectures, I fancy that any information I may be able to furnish that may correct, confirm, or supplement what is already known, will doubtless be to them acceptable. It is with this view that I now write on a few points, reserving for a future communication any larger statement that further travel, inquiry, and residence may enable me to make on the interesting country of Uganda.

Respecting the two routes to Uganda, viz., the German route from Bagamoyo and Pangani to Bukumbi, south of Lake Victoria, and the English route from Mombasa to Berkeley Bay (Sio Bay), Kavirondo, at the north-east corner of Lake Victoria, I have myself traversed the northern route, and, as to the southern, have made inquiries from the French missionaries, who always travel by it and even have missions in some parts of it, and from several of the C. M. S.'s men who have come to Uganda through German territory.

Until quite recently both routes were very difficult and even perilous. The winding, shadeless, broken paths; the steep ascents and descents in the neighbourhood of Ngaru and Usambara on the southern route and the Ulu and Man Mountains on the northern; and, beyond these heights, the numerous swamps and swollen rivers to be crossed, made both these routes difficult.

But the dangers to life and property were many on both routes.

On the northern route, if we divide it into four sections, the state of things was briefly as follows: -

First. From Mombasa to Machakos. Long exposure to a broiling sun; bad water at camping places or no water at all, *as is supposed*, in the Taru Desert (we found a small well there hidden away in a thicket); with barely sufficient food, which had to be carried from the coast; and fatiguing night marches to reach water or to save food.

Second. From nearing Kikuyu to Lake Naivasha. Fatiguing marches and danger from sudden change of climate.

Third. From Lake Naivasha to Kabras. Exposure to wild beasts and the unsubdued Wandorobo and Wanandi tribes; absence of food supplying stations (though extra food wanted on account of the heavy marches and the dangerously cold nights); and the deep and fast flowing Gwaso Masa torrent to be bridged and crossed. (Here most caravans have lost some men in the flood.) It is on this last part of the journey that most deaths occur in a caravan. The hardships and fatigues of the first two sections have told on the porters when the heaviest and most trying section has to be traversed. It was on these marches that three of my porters died of acute pneumonia, and a fourth was speared to death by the Wanandi. A month later Bishop Tueded and his party had eleven deaths among their porters in camp during one night, besides others who died here and there *en route* (in this section).

Finally, the fourth part of the journey, from Kabras to Uganda, is fairly easy, with numerous villages and the bananaries of Usoga and Uganda, where food can be obtained for beads, brass wire, shells, and small mirrors, and in Usoga and Uganda proper for calico.

On the southern route the dangers to life arise, in the first place, from the steep ascent into the high, cold regions, a few marches after leaving the hot climate of the coast; afterwards, on account of the heavy rains forcing long and dangerous halts, when the food supply may easily be exhausted; also, by reason of frequent exposure to the raids of unsubdued tribes and to death from famine. At the end of 1894 and beginning of 1895 a caravan belonging to C. M. S. lost over one hundred native porters from raids and famine. This I learned from some of the Europeans now in Uganda, and who accompanied that caravan. A year earlier a large caravan belonging to the French missions left Bagamoyo and was never again heard of. From these accounts it will be better understood what great changes are now being brought about on the northern or English route. I have not heard of any notable betterment on the southern route. By the month of October a good cart road will have been completed from Mombasa to Lake Victoria. The people of Ketosh have been chastised, and are now said to be friendly. The same may be said of the Wanandi—the dread of the Swahili porters. Since the late punitive expedition these Wanandi have not only ceased to molest caravans, but have actually opened their own country for traffic, and have themselves pointed out paths where a much shorter and easier road can be made from near Eldoma Ravine to Berkeley Bay on the lake. The Commissioner and Consul-General, Mr. E. G. L. Berkeley, has just started on a journey through the Nandi country, where he will no doubt succeed in establishing good friendly relations, and will decide on the new and shorter path which the road-makers are to follow. Three new stations are being set up *en route*, and it is expected that the Wanandi will supply food on what was the longest and most trying stretch through foodless country on previous journeys.

Lieut. Vandeleur, who accompanied Major Cunningham on the Nandi expedition, has made a good map of that country. His maps of part of Unyoro and the north-west of Uganda will also be valuable additions to the maps constructed by Captain Lugard, the railway survey party, and Captain Macdonald—the latter's map of Uganda and the northern shores of the great lake contains the most accurate knowledge we possess in published form. Lieut. Vandeleur has gone to England, and it is believed will publish his maps shortly. The necessity of having precise knowledge of the boundary line separating the ecclesiastical jurisdiction of the French missionaries from my own, has resulted in a nice little map of the course of the Swajali River that flows into Lake Gita Nzigi, including the Swajali's tributary and sub-tributary streams—Nasirya, Katabaano, Maanja, Nabongole, and Kairira; also of the little province of Kyadondo, in which Mengo is situated, and continuing from Mengo to the lake at Munyunyu, Murchison Bay. I hope to get more of this precise geographical information on missionary journeys that I am to make a few months hence.

The railway party at Mombasa are, I believe, making progress with over 1,000 Indian labourers; they have, no doubt, been somewhat delayed by recent disturbances in the neighbourhood. The entire country through which the railway will pass is, of course, quite undeveloped. It remains to be seen, in great part, what it can produce. From Nzoi to Lake Naivasha there is a healthy climate and over 1,000,000 of a population. (Uganda has about 450,000.) At the stations of Machakos and Kikuyu, under the able superintendence of Mr. Ainsworth (Manchester) and other intelligent officials, proofs have been given that the soil can produce abundant crops of grain. Much, however, of the land requires to be cleared of

various species of insects that destroy grain ; locusts, too, must be kept away from the crops by drummer boys beating their drums. The altitude makes the climate agreeable ; still, fresh food and milk do not keep many hours if special care is not taken. Hides, horns, and tusks will form the chief articles of export until agriculture develops and minerals are found. The same may be said of the whole region, Uganda included.

The great achievement in Uganda is that the people are now in a settled state of peace. Law, order, and liberty are better understood. House-building, after the European fashion, with palm-tree posts and sun-dried bricks as material and thatched roofs, is claiming a good deal of attention from the chiefs. This work, with road-making and the bridging of swamps, will help to develop habits of industry among the male population, whose chief employment for many generations has been the making and using of arms in war and in the chase. The country is not too thickly wooded with palm-trees, which, being impervious to ants, are extensively used for building. Hence, owing to the house-building movement (a great advance on the bee-hive huts), the establishment of Government stations and the erection of mission buildings, it has been thought advisable to start a forest department in a simple way. Rice seed and wheat seed have also been distributed in small quantities among the chiefs as an inducement to the peaceful and profitable labour of agriculture. Some have taken to it kindly ; others refused to take it up on the grounds of insecurity of tenure in their holdings. Hundreds of gum-trees have been planted on the main roads and in the vicinity of European residences as one means of making the capital more healthy. Over 1,000 natives are at present engaged making a canal through the sud* of a valley about four miles long, and running from Kampala to Murchison Bay. Two steamers are being fitted up at the south of the lake, and are expected here shortly. These, with a steel boat at present on the lake and another sailing boat now in course of construction at the French mission of Sese Island, will be an excellent provision for traffic on the lake. Most of this traffic is now carried on in canoes ; hence it often happens that loads which have been brought safe from the coast to the south of the lake are lost on the voyage of 14 days to Uganda.

The cost of bringing loads of 65lb. each to Uganda is almost prohibitive. £8 is the usual cost for the carriage of a load by the northern route ; but it is practically sure to arrive in two and a half months from Mombasa. £2 10s. will bring a similar load from Bagamoyo to Bukumbi, south of lake ; but it may take six or eight months to reach Bukumbi. If, however, the weather is favourable, and there is no famine, the caravan may arrive in six weeks ; then there remains the expense of canoes on the lake and the risk of total loss on the voyage. The railway will undoubtedly draw all this trade ; and with a few good steamers to convey goods safe that are destined for southern regions, will attract most of that trade. The proposed cost of a 65lb. load by the railway from Mombasa to Berkeley Bay is about 15s. It will, moreover, entirely do away with the horrors of caravan marching for months through these regions. One need hardly say that the railway will bring more into Uganda than it will take out for some time to come. Uganda is no gold mine ; it may become a bank, in the sense that money must be put into it in order to get a small interest. But I fear the capital must be sunk for a time. Seeds and plants of many kinds must be brought in and planted to see what the earth and climate will make of them. It is hoped that a good return will be made after patient waiting. On my own subject, I may say, that this has certainly been the case with Christianity in this country.—With kindest regards, believe me to be, dear Mr. Sowerbutts, yours respectfully,

H. HANLON, Uganda.

Sud : A grassy impediment in the river.

QUEENSLAND.—(*See Map.*)

By GENERAL SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.,
late Governor of that Colony.

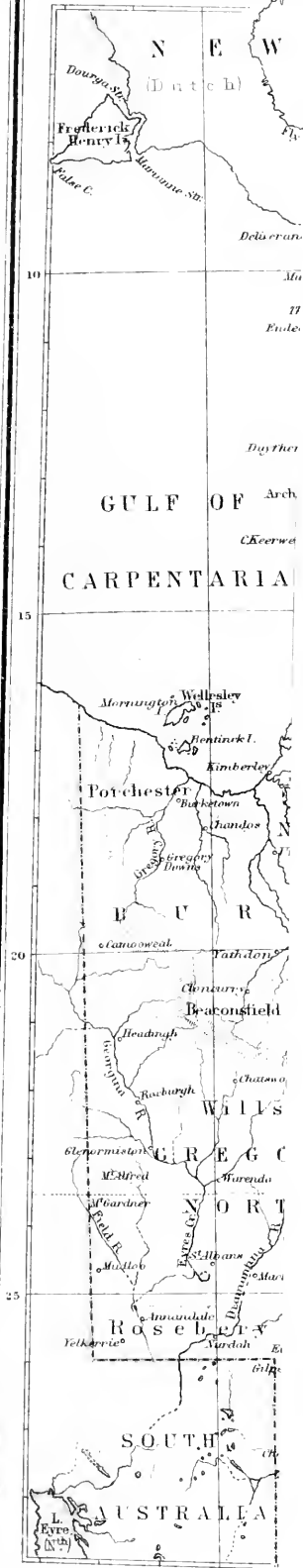
[Read before the Manchester Geographical Society, October 7th, 1896.]

MR. PRESIDENT. Ladies, and Gentlemen,—It gives me pleasure to comply this evening with the request of your Society to give you some particulars of the Colony of Queensland, which is the youngest of the Australian group; but which, I think, you will presently admit has had a vigorous and rapid growth, and, despite misfortunes and some errors, has every prospect of a splendid future which shall render it still more worthy even than it is at present to bear its honoured title. This title was given when the colony was formed, thirty-seven years ago, out of territory which belonged to New South Wales, and which before separation was little known and only sparsely occupied in a few districts, the whole population only amounting in 1856 to 17,000 souls.

I am glad to address you about Queensland, because it is well that our fellow-subjects here should know something of the great colonies of the Empire, and because I believe this Society has not yet had read before it a paper descriptive of this colony. I am also glad to speak here, as my doing so is in some sort an acknowledgment of the friendly feeling which has long existed between the Manchester Geographical Society and the Queensland branch of the Royal Geographical Society of Australasia, with which latter I have been connected since May, 1889. I am also glad to address you on this particular subject, as my gratitude to the Queenslanders for their kindly feelings towards me as their Governor for more than six and a half years causes me to be very desirous to make my fellow-countrymen acquainted with the position, capabilities, and prospects of this colony.

Nevertheless, I have no doubt that there are those here present who know as much as I do of most of the details I shall give, and I am conscious that in the brief period allotted for my address I must omit reference to many particulars of interest.

My acquaintance with Queensland is primarily due to my having held the position of Governor, but much of my knowledge of the colony could not have been acquired if the various





ministers and officials had not always been on cordial terms with me, and if I had not spent a good part of my time in visiting the various districts, whether near to the capital or far off, and if I had not freely mixed with colonists in all parts of Queensland, irrespective of politics or station, by whom I was always treated with frankness and with confidence. Of my travels I could give many curious and interesting details if time permitted. Of the portion of Australia which is now called Queensland, or, indeed, of Australia at all, little was known in England until the voyage round the world undertaken by that wonderful explorer and navigator, Captain James Cook, in the years from 1768 to 1771, when he coasted along and closely examined the whole coast from what he called Point Danger, and which is now the most southerly point of the Queensland coast. No doubt most of you are familiar with the incidents of that memorable voyage, and have heard how Cook, after narrowly escaping the entire loss of his vessel on the rocks of the Barrier Reef, had to beach her for repairs in what is called the "Endeavour" River, after the name of his barque, and at the site where for more than twenty years has now been established the town of Cooktown, called after the explorer. Many of the points on the coast still bear the names given to them by Cook, the reasons for bestowing which are explained in his Journal. I cannot, however, linger over the particulars of this most memorable voyage, but must now describe in the most brief manner this Colony of Queensland about which I have to speak to you to-night.

GEOGRAPHICAL DESCRIPTION.

Queensland comprises the whole of the north-eastern portion of Australia, as well as all islands within sixty miles of the coast, whether in the Pacific Ocean or in the Gulf of Carpentaria. The seaboard extends from Point Danger, the northern coast boundary of New South Wales, round by Torres Straits to the border of South Australia in the Gulf of Carpentaria, at a point about eighty miles north-west of the Queensland township of Burketown. The coast-line of the colony has a length of about 2,250 miles.

The land boundary runs from Point Danger west, dividing the colony from New South Wales, to the 141st degree of east longitude on the 29th degree of south latitude; and thence on the 141st degree of longitude north to the 26th parallel; and thence west to the 138th degree. It then runs north to the Gulf of Carpentaria, near the 16th degree of latitude. A little north of the 26th degree the border leaves New South Wales and runs along the east part of South Australia to the sea. Although Queensland in this direction only extends to within

16 degrees of the Equator, Cape York, the northern part of the colony, is in 10 degrees south. The greatest breadth from east to west is 900 miles, and the length from north to south is about 1,150 miles.

The total area of Queensland is, by the most recent measurement, 668,224 square miles, and to realise what this means we may draw some comparison with the extent of other countries with which the world is more familiar than it is with Queensland, such as Mr. Chamberlain drew in a speech made by him a few months ago, when he said that Queensland is more than three times the size of the German Empire, meaning, of course, the territories of Germany in Europe. In fact, Queensland is five and a half times larger than the United Kingdom. It is, indeed, larger by 24,000 square miles than the United Kingdom, France, Germany, and Italy combined. As, no doubt, the greater portion of Queensland is capable of supporting a moderate population, we may judge what an enormous increase might gradually and without inconvenience take place to the present inhabitants, who are less than half a million in number and not yet in the proportion of one person to each square mile.

It is obviously impossible in a short lecture to describe even in a brief manner all the geographical features of this vast extent of territory, especially as, I venture to think, I shall meet your wishes by devoting a portion of the lecture to what is a true branch of geography, namely, some account of the products and the people by whom the country is inhabited. I may, however, allude to certain important natural features of the country.

A range of mountains, known as the Coast Range, extends from the York Peninsula in the north to within a few miles of Brisbane, running nearly parallel with the coast, and at an average distance of 50 miles. It comprises many subsidiary ranges, and there are many peaks, the highest of which rises to 4,200ft. The Bellenden Ker Range in the north, to the south of Cairns, rises to 5,400ft. What is called the Main or Dividing Range, runs inland of the Coast Range, and extends from the head of the Damesq River to the sea coast at Point Danger, forming the dividing line between New South Wales and Queensland. The eastern portion of this range is called Macpherson's Range. In these latter mountains there are peaks which are over 4,000ft. in height.

Rivers are thrown off by the Dividing Range in four directions, namely, eastward to the Pacific, north-westerly to the Gulf of Carpentaria, south-westerly to the interior of Australia, and southerly into the system of the Murray River, which, after flowing for 1,100 miles, reaches the sea by Lake Alexandrina, S.E. of Adelaide. Of the first-mentioned the principal are the

Burdekin, the Fitzroy, the Burnett, and the Brisbane. None of these are navigable for any great distance. The Flinders, the Gilbert, the Batavia, and the Mitchell, which flow into the Gulf of Carpentaria, are only navigable near their mouth. The largest of the south-western rivers are the Georgina, the Diamantina, the Barcoo, and the Thomson. All of these are lost in the desert or in its salt lakes. The Condamine and the Warrego are tributaries of the Darling, which falls into the Murray River.

The coast of Queensland is studded with islands from Stradbroke and Moreton Islands in the south, the former of which is 33 miles in length, to the group of which Thursday Island in the north is one; and further on in the Gulf of Carpentaria we find the Wellesley group of islands.

But the most famous feature of the waters bordering the coast is the Great Barrier Reef, which extends from the Tropic of Capricorn up to Torres Straits, a length of about 1,000 miles, and at distances varying from 30 to 150 miles from the mainland. This great reef, or natural breakwater, has various openings for the passage of vessels, and at the present moment some of its features are being investigated by a scientific expedition from the United States. Mr. Saville Kent, who was for some years employed by the Queensland Government, has published an account of the Great Barrier Reef, which is beautifully illustrated, and which I would recommend to the notice of any one who desires to study the features of this most interesting work of nature.

The geology of Queensland is too large a subject, and I may say too difficult a subject, for me to attempt to deal with, but it is one of intense moment to Queensland, especially with respect to mineral production and artesian water from which so much benefit has been derived, and from both of which so much more advantage is to be hoped in the future. Those who desire to understand the geology of Queensland cannot do better than refer to the work on the subject by Mr. Jack, Geologist to the Queensland Government.

It is also impossible for me to tell you anything of the botany, or animals, or birds, or fishes of Queensland. All of these have special interest and many characteristics, either peculiar to Queensland or to Australia generally. I may say that some of the most beautiful birds in the world are to be found in Queensland.

The climate of so large a country, of course, differs much in its various divisions, but it is generally dry in the interior and damp on the coast; while in the country, very far inland, it is at times intensely hot, and again in the winter bitterly cold. At Brisbane the mean temperature is about 69 degrees, the extreme range being from 35 degrees to 106 degrees. The

rainfall in the interior is variable, and often scanty. At Brisbane the mean rainfall is about 35in., most of which falls from November to May.

POPULATION.

The population of the territory which now comprises the colony was only 2,257 in 1846, but had increased to 393,718 by the census of 1891, and was estimated at 460,550 on the 31st of last December. Of course a large portion of the great increase in the early years was due to immigration from the mother country or other colonies, and in 1890 it was estimated that a quarter of a million of immigrants had come to Queensland. Since 1892 the Government has ceased to pay the passage of immigrants, who up to that time had been given free passages from the United Kingdom if they came under certain conditions. This arrangement has, of course, lowered the rate of increase of population. Arrangements are now in progress by which immigrants can be brought out at a charge not exceeding £12 a head, and this may give some stimulus to immigration.

The increase to the population from excess of births over deaths is considerable, as it is indeed in all the other Australian colonies. In 1895 the excess of births over deaths was 9,722. 259,160 of the population are male, and 201,390 are females; and at the last census in 1891, when the usual classification of the population was made, it was ascertained that 176,971 persons were of Queensland birth, 77,187 were born in England, 43,036 in Ireland, 22,400 in Scotland, 28,336 in other Australian colonies, 1,419 in America, 22,085 in European countries, 9,580 in China, India, and Japan, and 9,338 were Polynesians. Of foreign Europeans some 15,000 are Germans, who congregate greatly in particular districts, and make excellent colonists. It has not been possible to take any census of the aboriginals, who only exist in considerable numbers in Northern Queensland, but they are estimated at 12,000. In 1891 there were about 2,600 persons in the colony of other alien races than those named.

As to religions, the census of 1891 showed that of the Christian population 142,555 were members of the Church of England, 92,705 of the Church of Rome, 45,639 Presbyterians, 20,917 Wesleyans, 23,383 Lutherans, 10,256 Baptists, 28,841 of other Christian denominations, and 809 were Jews.

There are three nationalities in Queensland of which some special mention seems desirable—the Chinese, the Japanese, and the Pacific Islanders. Some years ago the opposition to the advent of Chinese, who were coming over in large numbers, was very strong, and a restrictive law was passed which has decidedly checked the increase of people of this nation, of

whom very few women have ever come to the colony. Of Japanese I believe a few years ago there were hardly any, but in late years these people have increased, and are found now in considerable numbers at Thursday Island and in the pearl shell fishery in Torres Straits. A number, too, have come for temporary employment on sugar plantations in Northern Queensland under conditions made between the Japanese Government and the agents of the Queensland employers. The employment of both Chinese and Japanese is resented by the white labouring population, and if the Japanese were to increase to any considerable number there is little doubt that the colony would desire to make the Chinese Restriction Law apply also to Japanese.

With respect to the Pacific Islanders, many of you are aware that there has been a warm controversy carried on as to whether they should be brought to Queensland at all. They are recruited and brought to serve as agricultural labourers within the tropics, and the contention of those engaged in the sugar industry is that field labour cannot there be carried on by whites, and that without black labour the estates would be given up and a most valuable industry lost to the colony—an industry, too, in which a large number of whites find regular and profitable employment, for there are various occupations on a sugar estate which necessitate that a proportion of about one-fourth of the whole should be white men. On the other hand, the opponents of black labour allege that whites *can* work on cane plantations in the tropics, and they urge that great abuses are committed by recruiters, and that the Islanders return to their homes much damaged in moral character by acquaintance with vices they were unused to. No doubt there used to be serious abuses in recruiting, but under the existing strict regulation and supervision abuses are rare, and when detected meet with severe punishment to those concerned; while the treatment on the estates, most of which I personally know, is excellent, and is subject to constant inspection. That the service is popular may be gathered from the fact that large numbers of the Islanders return to Queensland for a second or third term of service. Many of them return to the islands educated, and the clergy of different denominations and several ladies work among them with success. Still their presence is not without drawbacks and difficulties, and may possibly come to a termination in the future. The substitution of indentured Indian coolies, as in the West Indies and Mauritius, might, perhaps, solve the difficulty; but this change would not, I think, be approved by a Queensland Legislature; and one thing is certain, that is, that the Queenslanders are determined to be a white people, and that the advent of all dark-coloured races to settle in the colony will be discouraged. Hence will arise

difficult problems, especially as it has yet to be ascertained that a third or fourth generation of white persons is capable of hard out of door labour in the hottest or most unfavourable parts of Northern Queensland. There are now 7,798 of these people in Queensland, as against 9,338 in 1891.

The present rate of increase of population in the colony is about 3½ per cent. and this may probably be looked on as the rate of future increase by means of excess of births over deaths and by immigration, plus any increased immigration which may arise in consequence of higher inducements which may be hereafter held out to immigrants.

TOWNS AND PLACES OF IMPORTANCE.

I can only mention a few of the principal places, and select them either on account of their large population or because of some importance that may attach to them for special reasons.



BRISBANE AND NEIGHBOURHOOD.

First of all comes Brisbane, the capital, on the Brisbane River, or, I might say, encircled by the Brisbane River. It is the seat of Government, and contains with its suburbs about two-ninths of the whole population of the colony—more than 100,000 persons. It has many fine buildings, and is in various ways an agreeable place to reside in. It has a large trade and various manufactories, and, owing to the constant care taken in dredging, ships of 4,000 tons or even of a larger size come up to its wharves. Last year the imports and exports at Brisbane taken together were of the value of £4,930,000.

There are numerous churches, and there are many charitable, scientific, and educational establishments, with clubs of various kinds; and there are several pleasant seaside resorts within a

few miles of the city. There are defences which would render an attack on Brisbane from the sea very difficult.

Between Brisbane and the New South Wales border, on the line of direct railway, are the important towns of Ipswich and Toowoomba, and the smaller towns of Warwick and Stanthorpe.

Ipswich is on the River Bremer, an affluent of the Brisbane River. The first house was erected as far back as 1829. It is the centre of a mining, manufacturing, and agricultural district. Coal abounds in the neighbourhood, and in the town are various manufactories and large railway workshops. There is a population of over 13,000 persons. Ipswich is about 23 miles from Brisbane.

Toowoomba is the principal town on the Darling Downs, 100 miles from Brisbane, and 1,921ft. above the sea level. The municipality has a population of 7,000, and the town is the centre of a rich pastoral district, in which also agriculture is making progress. There are very pleasant residences in the neighbourhood, in one of which I lived during a considerable part of two summers. In the district there is a population of 30,000. Coal is found in the neighbourhood.

Warwick and Stanthorpe are smaller places, but the former is of some importance. It is on the Condamine River, which runs into New South Wales, and is a well laid out place. Agriculture is the backbone of Warwick, but it has some manufactories, and coal and other minerals are found in the district. The town is about 1,500ft. above the sea, and is 169 miles from Brisbane by train. The population of the town in 1891 was 3,400.

Stanthorpe, 207 miles from Brisbane, is close to the New South Wales border, and is 2,656ft. above the sea level. This district a few years ago produced large quantities of tin, but the alluvial deposits are being gradually worked out. Fruit in this neighbourhood is being grown in great perfection, and a great deal of tobacco is now grown near Stanthorpe. The climate is delightful. In the town boundary there are only 735 persons.

On the northern branch of the Southern and Western Railway beyond Toowoomba there are only two towns of some importance, Charleville and Roma. The former is the present terminus of the railway, and is 483 miles west of Brisbane. It is on the Warrego River, and is the starting point of many stage coach lines to distant towns and stations. The district around is pastoral, but extensive market gardening is carried on by Chinese. The population in the town limits is 1,450. Here there is a very fine Government artesian bore, which can give an out-turn of 3,000,000 gallons of clear fresh warm water daily.

Roma, which is between Charleville and Toowoomba, is 318

miles from Brisbane, and is 978ft. above the sea level. The district is a pastoral one, well stocked with sheep and cattle, but agriculture is now making good progress. The population of the town in 1891 was 1,698.

Passing over various towns of small populations in the immediate neighbourhood of Brisbane, the first place of considerable importance which we reach going north is Gympie, 107 miles from Brisbane, on the line of railway and on the upper waters of the Mary River. It is a large gold-mining town, gold having been first discovered there in 1867, and its future prospects are thought by experts to be very good, though in 1895 the yield was less than that of 1894, which latter was a very good year. The Gympie goldfield up to the end of 1895 had yielded 2,036,380 ounces of gold. The population of the municipality is 8,449.

Going northwards 61 miles by railway we arrive at Maryborough, on the banks of the Mary River, 25 miles from its mouth. There is a constant communication with Brisbane and other places by steamer, and vessels drawing 17½ft. can berth at the wharves. There are several foundries, timber and other manufacturing works here, and timber in the neighbourhood, and much maize and sugar-cane is grown. The latter gives employment to a considerable number of sugar factories. Many cattle are raised in the district, and there is employment for a number of men in the turtle and oyster fishery in the bay outside the river. A large and important smelting works is situated four miles from Maryborough, and there is a considerable coal-field in the neighbourhood which is steadily worked. There are about 10,000 people in the municipality. The imports in 1895 were of the value of £233,185, and the exports were worth £123,705.

About 54 miles north of Maryborough is Bundaberg, on the banks of the River Burnett, 216 miles from Brisbane. Vessels of 500 tons come up to the town. There are sawmills and breweries here, but the great industry is sugar, of which large quantities are grown in the neighbourhood, and there are several sugar mills. The population of the municipality in 1891 was 3,982, and of North Bundaberg 940. The imports in 1895 were of the value of £94,619, and the exports £242,545.

Gladstone, which is 350 miles north-east of Brisbane, is important rather from its capabilities than from its present condition. It has a fine deep, well-sheltered harbour, with a pier alongside which ships drawing 26ft. can lay. There are minerals, including gold, in the district, but the production has not yet been large. A fair amount of agricultural produce is grown in the district, but the place has not progressed as might have been expected. Cattle have, however, often been shipped to New Caledonia, and horses have been shipped to India. The

railway between Gladstone and Bundaberg, which long remained with its middle section unmade, is now being completed, and when this is finished the place may progress better. There are only 432 people in the town.

Ninety-one miles north-east of Gladstone is Rockhampton, situated on the Fitzroy River, about 30 miles before it discharges itself into Keppel Bay. It is about 420 miles north of Brisbane, with which as yet it has no communication by railway. It is by far the most important place in the central portion of Queensland, and is the seat of a Protestant and Roman Catholic Bishop. Vessels of over 1,000 tons come up to the town, and improvements are being made to complete a deep water harbour in Keppel Bay connected with Rockhampton by railway, the construction of which is sanctioned. The Central Railway, which taps an immense extent of country, commences at Rockhampton; and there are mines, including the famous Mount Morgan Mine, in the neighbourhood, as well as good grazing land. The Rockhampton goldfield has, since 1883, yielded 1,499,649 ounces of gold, and the yield in 1895 was 135,908 ounces. The extensive Fitzroy Meat Works are just below Rockhampton on the river bank.* Some idea of the importance of Rockhampton may be gathered from the fact that the exports for 1895 were of the value of £2,498,827, or more than £500,000 in excess of the value of the Brisbane exports. The value of the imports was £494,023. The population is about 12,500.

The next place of importance going north is Mackay, close to the mouth of the Pioneer River, 625 miles from Brisbane, with which it has only communication by sea. It has a small local railway, which serves to bring the sugar grown in the district to Mackay. Around Mackay there are important sugar estates, and sugar is the staple production. As yet no satisfactory plan has been carried out for improving the river channel, and all but small vessels have to be loaded from barges or small craft in the bay, where shelter is far from perfect. The exports from Mackay in 1895 were of the value of £265,810, and imports £115,981. The population of the municipality in 1891 was 3,597.

Bowen is the next town to the north, and is 725 miles from Brisbane. It is the outlet of a large area of pastoral country, and there is a good harbour. There is a fair agricultural country and mineral wealth near at hand, but the resources are not fully developed, and the railway, which runs 48 miles inland, requires completion to some point in the Northern Railway to be of real value. The population of the municipality in 1891 was 2,778.

* Since I delivered this lecture, I see by a telegram that these works have closed operations. I trust this is only for a brief period.

Townsville, which we now come to, is the principal city in Northern Queensland, and is situated on the shore of Cleveland Bay. A sheltered harbour has been made at considerable cost, and there are two batteries constructed for defensive purposes. There are many manufactories in and about Townsville and important meat freezing works. It is the starting point of the Northern Railway, and is the seat of a considerable and a varied trade. The population of the town and immediate neighbourhood was, in 1891, 13,016. The exports in 1895 were valued at £2,146,825, and the imports at £715,882. Townsville is about 870 miles from Brisbane.

Eighty-two miles inland from Townsville on the line of the Northern Railway is Charters Towers, at an elevation of 1,000ft. above the sea. It is the site of a well-known and prosperous goldfield, and is a flourishing town, which has been greatly improved even since I first visited the place in 1890. The goldfield was discovered in 1870, and mines are now worked at a depth of 2,000ft. There is no sign of the field being exhausted, and more than 3,000 miners are employed in and about Charters Towers. No less than £289,000 was paid in dividends at Charters Towers in the year 1894. Last year the yield of gold was 256,577 ounces, and the total yield since the field was opened has been 3,350,139 ounces. Of course, by the present improved scientific processes a larger quantity of gold per ton is now obtained than was formerly possible. I may add that at a place called Ravenswood, 50 miles east of Charters Towers, there is another field which produced 14,000 ounces last year, and has yielded 434,911 ounces in all.

Charters Towers had, in 1891, a population of 4,597 in the municipality, but has probably increased, and it is believed that there may be now 20,000 souls on the field.

Going northwards from Townsville, we arrive successively at the towns and harbours of Cairns, Port Douglas, and Yorktown.

Cairns has a good harbour and is the outlet for various mines, and also for a quantity of sugar, one fine estate with the best machinery being only a few miles off. The costly Herberton Railway commences at Cairns, but has only been completed for 48 miles, and work has been for some time stopped. In the neighbourhood of Cairns bananas are much cultivated by Chinese, and are sent by steamers to southern ports. By the census of 1891 there was a population of 2,460 in Cairns. The imports last year were of the value of £62,000, and the exports were worth £167,000. Herberton, 80 miles inland from Cairns, is nearly 3,000ft. above the sea, and promises to be a place of importance. There is tin, copper, and silver in the neighbourhood. There is fine agricultural land, and a good deal of cedar and other timbers; but as yet production is not fully developed, and the fall in silver has injuriously affected the workings of

that metal. The comparative coolness of Herberton is sure to make it attractive.

Going up the coast from Cairns, and passing Port Douglas, a small place but with fairly good prospects, we arrive at Cooktown, which is situated on the southern bank of the Endeavour River. Here there is a monument to Captain Cook. Cooktown owes its rise to the discovery of the Palmer goldfield, the production from which has of late years been small, although in all it has produced 1,346,304 ounces. From Cooktown a railway, which has been found to be very unprofitable, runs inland for 67 miles. Cooktown is the port principally used in communication with British New Guinea, and most of the vessels which come through Torres Straits from China or England call at Cooktown.

Sugar, tobacco, and rice are grown here, and coffee is being successfully raised. A good deal of *bêche-de-mer* and pearl-shell fishing is carried on from this port. The imports last year were valued at £50,000, and the exports at £73,000. The population is 2,620 whites and 360 Chinese.

Four hundred miles north of Cooktown is Thursday Island, in Torres Straits, a place which has assumed a position of some importance as a port of call and a coaling station, and a place of refuge in time of war. The place has been much improved of late years, and a jetty has been constructed here with a minimum depth of 22ft. of water. Many vessels call here. This and the adjacent islands are under the control of a Government Resident.

A battery has been constructed which commands the harbour and the approach to it, and there are good barracks for a small garrison. This latter consists of a detachment of the Queensland Permanent Artillery, which would have to be reinforced if war threatened.

In a neighbouring island there is a quarantine station, and there is also a leper asylum for coloured people.

The resident population numbers about 1,400, many of whom are of very mixed races, such as Japanese, Chinese, Javanese, Malays, Philippine Islanders, Cingalese, South Sea Islanders, and aboriginals. There is also a floating population, estimated at 1,770, engaged in maritime pursuits, and there are several pearl-shelling stations in the neighbourhood of Thursday Island. Gold is found in one of the neighbouring islands, and 320 ounces were not long since obtained there.

Thursday Island is the transshipping port for cargoes and passengers from Europe and the East bound to ports in the Gulf of Carpentaria.

The imports last year were valued at £34,480, and the exports at £79,686.

In the gulf there are two ports—Normanton on the Norman

River and Burketown on the Albert River. Both rivers have bars, and a good deal is needed to improve them, but inside the Norman River it would be possible to have a good harbour.

Normanton is the outlet for the Cloncurry gold and copper mines and for the Etheridge and Croydon goldfields, and is connected with Croydon by a railway 95 miles in length. Croydon is purely a mining town, although there are cattle stations in the vicinity. It had, in 1891, a population of 1,231 in the municipality, and 3,751 in the field. It produced last year 69,742 ounces of gold, and has yielded since the field was opened ten years ago 544,000 ounces.

The population of Normanton, in 1891, was 1,231. Last year the imports were valued at £47,000, and the exports at £247,700.

Burketown, on the Albert River, is a very small place, but I mention it because it is the only township in the gulf except Normanton, and as there are minerals and cattle stations in the interior it may become a place of importance.

It is believed by some that a very good harbour might be formed inside the mouth of the Batavia River, which flows into the gulf.

I have briefly spoken of the towns mentioned, but I have omitted many, a few of which are larger than some of those I have mentioned, and are of more or less local importance, such as Clermont, Springsure, Barcaldine, and Longreach in the central districts, all of which have communication by railway with Rockhampton, and also Blackall, 80 miles south of Barcaldine. Longreach is the present terminus of the Central Railway, and is 427 miles from Rockhampton. All these places are in pastoral districts, and near Clermont gold and copper have been found, and there is a coal supply.

In concluding this part of my paper, I may remark that even in small townships there are usually to be found one or more places of worship, a hospital, a State school, and what is called a School of Arts, but which is really a library and reading-room, with a hall for meetings, entertainments, and lectures. It would be rare to find a township without a racecourse, and still more rare to find one that did not possess a public-house.

COMMUNICATIONS.

At the beginning of the present year there were 2,386 miles of railway open in Queensland, and there were 170 miles in course of construction. I shall later on give the cost of the railways and of maintenance and working and the receipts. There is no doubt that mistakes were made in construction which led to unnecessary expense, and some of the smaller lines will not be remunerative for a considerable time, if ever.

In fact, in three of these, the aggregate lengths of which are 162 miles, the receipts do not cover the working expenses, and one of these of only 47 miles is a most expensive line, and cost £1,093,500.

The principal lines are as follows:—

The southern and western lines which connect Brisbane with the New South Wales line at the border township of Wallangarra, a distance of 232 miles, passing the important towns of Ipswich and Toowoomba, and running over the elevated country of the Darling Downs. There are three branch lines from this main line, and from Toowoomba, at a hundred miles from Brisbane, a line runs west to Charleville, which is 485 miles from Brisbane. This line is now being carried on to a place called Cunnamulla, 130 miles further on, and within 81 miles of the New South Wales border, from whence it is about 90 miles to Burke in that colony, which is in railway communication with Sydney.

The next important railway is the one which running northward connects Brisbane with the towns of Gympie, Maryborough, and Bundaberg, 216 miles, and is now being carried on to Gladstone, 328 miles from Brisbane. There will then be through communication by rail from Gladstone, by Brisbane, Sydney, and Melbourne with Adelaide, a distance of over 2,100 miles, and at Sydney, Melbourne, and Adelaide there is communication with the whole system of the New South Wales, Victorian, and South Australian railways. Unfortunately there are breaks of gauge at the New South Wales and Victorian borders.

The third principal line in Queensland starts from the important town of Rockhampton, on the Fitzroy River, which falls into the sea at Keppel Bay, 30 miles from Rockhampton. This railway runs west to a place called Longreach, a distance of 425 miles, and with its two branches, taps a vast extent of country. It is now to be extended to the sea.

The fourth main line runs from Townsville on the sea coast westward to Charters Towers, one of the most important mining centres in Australia, and goes as far as Hughenden, which is in a rich pastoral district, 236 miles. This line is to be extended 150 miles further, to a place called Winton, also the centre of a rich pastoral district.

I cannot even allude to all the various smaller lines, except to mention that there is a small but useful railway of a length of 31 miles in the sugar district of Mackay, and one of 95 miles, which connects the mining district of Croydon with Normanton, on the Norman River, which flows into the Gulf of Carpentaria.

The Northern Railway, namely, that from Townsville to Hughenden, of 260 miles including a branch, earned last year £7 12s. 0d. per cent, and the line from Rockhampton earned

£4 11s. 8d. per cent. No other railway as yet pays the whole of the interest due on the money borrowed for its construction.

When you glance at the map you will see that large tracts of country are still far removed from railways, and travelling in those districts is very tedious, but most townships of importance are in communication with railways by means of stage coaches,

The coastal communication is maintained by three regular lines of excellent steamers, which run along the Queensland coast and on to Sydney, Melbourne, and Adelaide, while one line runs up to Torres Straits and to the Gulf of Carpentaria. There are also steamers from England by Torres Straits and from China that often call at Queensland ports on their way to Brisbane or Sydney.

Postal communication at a distance from the railway lines is necessarily tedious, but the electric telegraph extends to the remotest parts of the colony, and there are 9,979 miles of telegraph lines, with 366 stations in the colony.

PUBLIC DEBT, REVENUE, AND EXPENDITURE.

The public debt of Queensland on the 30th June last was £31,944,934, on which interest of £1,286,530 has to be paid.

This seems an enormous debt as compared with the debt of the United Kingdom, having regard to the fact that the population of the latter is 38,000,000, and of the former not quite 500,000. But it must be borne in mind that in Queensland the railways are the property of the State, and that the cost of construction of these works, which amounts to £18,743,488, forms by far the larger part of the debt. The difference between the United Kingdom and Queensland also comes out in the relative receipts and expenditure. Here, of course, the public treasury does not receive the earnings or pay the current charges of railways, while in Queensland the former are part of the public revenue, and the latter are included in public expenditure. This consideration has always to be borne in mind when speaking of colonial finances. Then again £3,000,000 of loan money has been expended since 1860 in bringing out immigrants, and the balance has been expended on objects that if not directly remunerative, were intended to be of use to the colony. In fact, the actual interest paid on the debt, which amounts to £1,286,531, is practically reduced to £721,157 by the net receipts from railways, which amounted last year to £408,330; by £66,639 interest received from local bodies who have been given advances of loan money; and by £90,405 received from banks as interest on the public balances which have been abnormally large, owing to the bank deposits held at the time of suspension and reconstruction, and on which $4\frac{1}{2}$ per cent interest is paid to all depositors.

Notwithstanding these helps to payment of interest on debt the burden is still severe in Queensland, as it is in other colonies, and every now and then it may be noticed that suggestions are put forward for the consolidation of the various Australian debts in view to a reduction of the rate of interest, and this is urged as a reason for federation, which is thought to be essential for such a consolidation to be effected. I myself do not see how federation or consolidation could reduce the rate of interest on the debt.

The various loans are borrowed at certain rates of interest and for fixed periods, and until these periods expire it would be a breach of agreement to pay off the creditor, who would suffer by having his money thrown on his hands when he could not elsewhere command the rate of interest which was promised to him in return for his money. Any measure of the kind would savour of repudiation, and would, I am sure, never be approved by an Australian Legislature. Of course now that money can be borrowed cheaply it is good policy to pay off loans borrowed in former days at comparatively high rates by money borrowed in the present cheaper market as soon as the fixed periods expire, and this is the practice. For instance, at the end of last year money was borrowed by the Queensland Government at $3\frac{1}{2}$ per cent, and a loan of £765,000, which had been borrowed at 6 per cent in the year 1870, and was due for payment on the 1st January last, was paid off and a substantial saving in interest effected.

No more loans are due for payment until 1913, when a debt of £1,466,000, borrowed at 4 per cent, falls due, and in 1915 a very large amount of loan money, borrowed at the same rate, falls due, and it is to be hoped a saving in interest may then be effected. Before 1913 it seems to me that consolidation could not help in reduction of interest without the commission of a breach of faith.

The revenue of Queensland for the year which ended on the 30th June last was £3,641,583, which would give a rate of about £7 for each man, woman, and child in the colony, but this includes gross railway receipts to the amount of £1,052,691, or considerably more than a fourth of the whole. There are also large payments to the State in Queensland for occupation of lands which belong to the Government, and which payments are in the nature of rent rather than taxes. In Queensland, of the revenue, excluding railway receipts, about half, or £1,290,795, is realised by customs duties on imported articles, which press lightly on the poorer classes. The taxation, though heavy, is in fact not as burdensome as would appear at first sight.

The total expenditure last year was £3,567,947, but this included a sum of £640,661 for the maintenance and establish-

ment of railways which here, in the United Kingdom, would be defrayed by the railway companies. The expenditure then, after deducting railway receipts, amounts to £2,927,286, but of this no less than £1,286,530 is due to the interest on debt, which is punctually paid half-yearly in London or elsewhere. It thus appears that the whole current cost of the administration of this very large colony is not extravagant, and during the last two years there has been a surplus of income over expenditure of £104,000 and £73,000 respectively.

With these details before us as to debt, income, and expenditure there is ground for hope, if good government continues and if there is a decided abstention from borrowing except for really reproductive purposes, always provided that there is no extravagance as to ordinary expenditure, that the financial position will be excellent. At present and for some time past the Government has enforced a strict economy in all departments.

First it may be expected that railway receipts will increase in a larger proportion than railway expenditure, for traffic on many lines is not fully developed. At present the receipts are £408,330 in excess of expenditure, which gives a return of £2 3s. 6d. per cent on the whole capital sunk. It is probable that the receipts will gradually rise, as population and commerce increases, to such a sum as will pay the whole interest on the sums borrowed for railway construction.

Then the Legislature last year passed a law by which the surplus revenue of each year, as certified by the Auditor-General, is to be made over to commissioners for the purpose of reducing the debt by extinguishing such amount as may be practicable by purchase or by any other means.

Other resources may reasonably be expected to improve, and even now I think great credit is due to those ministers who have during the last few years done so much to remove financial trouble, to improve the condition, and to raise the credit of the colony. Even before troubles became acute, and at the present moment, the Government has done and is doing much with a view to help progress. Of these I will detail some measures. For several years one or more travelling dairies have traversed the country to give practical instruction, which was much needed, in the successful preparation of cheese and butter, and this arrangement has been very successful.

Then the Government has constructed various artesian wells, an example which has been largely followed. The success has been so great that in large tracts of country the evils of droughts will be greatly mitigated, and the progress of agriculture facilitated.

In his financial statement last July, Sir Hugh Nelson gave some particulars with respect to the boring operations of last year. The whole subject is most interesting, and discussion is

now going on as to the probable permanence of supply. It is certain that most of the bores are now working well, and that they are very beneficial, but as to the exact sources of supply and permanence there seems to be some doubt. You will, I hope, to-night see a lantern slide which will show a well in operation. The bore at Winton, in Western Queensland, which is, I believe, the deepest, is 4,010 feet deep, and cost £8,063.

The colony, with its great want of surface or flowing water in many places, cannot fail to benefit by the construction of artesian wells in all suitable localities. Already in Western Queensland the output of artesian water is estimated at 215 millions of gallons daily. The Government has done much to benefit the meat and sugar industries, by advances made to enable factories to be started, and attempts to start co-operative community settlements for the unemployed, after the crisis of 1893, and which the unemployed seemed to desire, were honestly made and persevered in. They, however, have unfortunately signally failed, after a considerable expenditure of public money. We see now, too, that the Government are taking off some £50,000 a year from Customs duties, in view to assist the producing interests of the country, and in other ways are helping the community to develop productions.

For several years the Government have employed a professor of agriculture from America, to lecture and to give advice to farmers, and now an agricultural college is being started, a travelling dairy for instruction has been in operation for several years, and an expert in the art of preserving meat too has been brought from America to give instructions on the subject. Land is sold or leased to intending settlers on very easy terms. Finally, in addition to the result to be expected from efforts to develop agricultural products, we may at any time learn of the discovery of gold in large quantities in those districts where the ore is known to exist. I must not omit to mention that there has, for a long time past, been an excellent meteorologist in Queensland, whose forecasts are of great value to the community.

PRODUCTS, IMPORTS AND EXPORTS, AND PROSPECTS.

Queensland possesses such a variety of climates, owing to the varied elevations of the country, as well as to the extent of latitude from 29 degrees to 10 degrees south, that there is little limit to its capabilities of production where soil is at all favourable.

To take, first, the live stock, there were in the colony at the end of last year 468,743 horses, 6,822,401 horned cattle, and

19,856,959 sheep. This was a substantial increase in horses and sheep over the previous year, but a decrease of horned cattle to the extent of 190,596. As yet the trade in horses with other markets has not assumed considerable dimensions, though I believe a proportion of the horses sent to India from Victoria have been bred in Queensland. The great exports connected with sheep and cattle were, last year, 61,250,000lbs. of wool, valued at £2,986,989; frozen or chilled or preserved or salt beef or mutton, £1,023,031; hides, horns, and hoofs, £245,955; sheepskins, with which, however, are included kangaroo skins, £217,687. Tallow was also exported to the value of £595,992. A total of over £5,000,000 sterling from cattle and sheep alone.

The other principal articles exported in 1895 were: Gold ore and gold in dust and bars, of the value of £2,267,345; sugar, of the value of £796,117; tin, of the value of £74,287; pearl shell, of the value of £71,808; and a variety of products of less value.

No articles of export are included in the foregoing statement that are produced in other countries and re-exported, and, of course, the large consumption of some articles in the colony itself keeps down the quantity exported.

The principal articles of import last year were as follows: Cotton, woollen, silk, and linen piece goods, £532,180; manufactured articles of the same material, hats, and haberdashery, £564,078; manufactured metal, £684,700; bullion and specie, £601,000; flour, maize, oats, wheat, etc., £377,000; oilmen's stores, £351,000; spirits, wine, and beer, £243,000; and a large number of articles of a smaller amount.

The total value of exports and imports respectively were £8,655,612 and £5,270,820 respectively. The exports were £253,000 and the imports rather more than £1,000,000 sterling in excess of those of 1894.

Exports to the value of £3,418,516 went to the United Kingdom, and imports of the value of £2,308,675 came direct from there.

There seems no reason why all the imported flour, maize, etc., should not be produced in the colony; and I have no doubt the large sum on this account sent to other colonies will be gradually reduced. Nor am I at all certain that Queensland may not in time produce all the tea and coffee it requires for its home consumption, instead of sending about £135,000 elsewhere for these articles.

And now I would say a few words with respect to mineral productions. You may have observed that in the statement of important exports and imports I did not mention coal. The reason for this is, that as, in point of fact, Queensland produces coal for its own wants, the import and export are trifling.

323,968 tons were produced last year, a quantity which has only been exceeded in one year since 1860.

The yield of gold in Queensland in 1895 was 631,682 ounces, the value of which, at the average of £3 10s. an ounce, is £2,210,880. In 1894 the output of gold was larger than that of 1895 by about 48,000 ounces. The principal goldfields are at present the Charters Towers, the Gympie, and the Rockhampton, and the whole yield of gold in Queensland since the end of 1877 has been 10,558,000 ounces, which is valued at £36,955,117.

I believe that the Mount Morgan Company since 1882 has paid about £4,000,000 sterling to its shareholders in dividends, and still pays dividends at the rate of 30 per cent on the original £1 shares.

Now, it will at once occur to you that a country with all these products and with a population of less than 500,000 ought to be very prosperous, and, in point of fact, the colony has been prosperous in the past, and there is every reason to hope that it will be prosperous in the future. Certainly during the few years previous to last year it has been in a state of depression, and it is desirable that I should mention the causes for this depression.

I think the first and greatest of all causes has been over speculation mainly in land and mines. Owing to the large sums that were flowing in in the shape of loans from England a few years ago money was easily borrowed. Every one thought that the value of land was steadily going up, and land was accordingly bought, often with borrowed money, in the conviction that the rise would enable fortunes to be made in a brief period. The same process was followed with mining shares, and I believe Mount Morgan shares of £1 were bought at £17. Instead of a rise these shares suddenly fell from £17 to £8, and then went to about £2 or £3. Land also steadily went down, and is now in many cases not saleable. Speculators were thus ruined, and financial institutions left in possession of property which could not be utilised or sold. There were other forms of speculation no doubt, but the result of all was more or less the same. Eventually many banks, not only in Queensland but throughout Australia, suspended payment, and depositors and shareholders were alike involved in trouble, and many were reduced to actual poverty.

Then strikes, more or less attended with violence and intimidation, helped greatly to depress trade, and in the case of the shearers the maintenance of order involved in Queensland a considerable charge on the revenue. Disastrous droughts and floods have helped to inflict loss and in some cases ruin upon many; and without pretending to enumerate every kind of misfortune, I may name that the latest pest, the cattle tick,

which has destroyed many cattle in Northern Queensland, and has led to their export to other colonies being prohibited, is very serious.

Prices of articles of produce, too, have for some time past been so low as to bring little or no profit.

These evils will, I have no doubt, pass away, or be successfully battled with. I have seen the courage and the self-helpfulness, and not only the self-helpfulness but the desire to help others so strongly displayed in Queensland in danger and in trouble, that I am sure the colony will rise superior to all the misfortunes that have befallen it. In the crisis of the flood of 1893, at Brisbane and Ipswich, and in other places, persons of all classes who had suffered severely exerted themselves strenuously and unceasingly to aid those who had been rendered homeless and destitute by that terrible visitation, and many lives were saved by the heroic devotion of those who were often ignorant for whom they were imperilling their lives. I am quite certain that Queenslanders will not shut up under misfortune, and that the colony will advance greatly in the next few years, having learned much wisdom from the past sad experiences.

CONSTITUTION AND GOVERNMENT.

I suppose you are all familiar with the system of government in these colonies, which are what is styled "self-governing colonies," of which Queensland is one. The system closely follows that which has existed in this country, and which we so deeply prize. The Governor is appointed by the Crown, and is the Queen's representative, and there is an Upper House and a Lower House. In Queensland the members of the Upper House are appointed for life by the Governor, and the members of the Lower House are elected on what is equivalent to a universal male suffrage, subject, however, to certain obvious disqualifications, and to a certain period of residence in a particular electorate. The Governor acts on the advice of the Ministers of the Crown, who are all members of one or other of the Houses of Parliament, and they must represent the majority in the Lower House. The Lower House is dissolved every three years, but may be dissolved by the Governor at any time. The members of the Upper House may vary in numbers, but usually in Queensland are limited to 42 or thereabouts.

In the Lower House there are 61 electorates which return 72 members, and on the 31st December last there were 86,878 electors. The smallest number of registered electors in any electoral district with one representative is 420, and all the 11 electorates that have two members consist of more than

2,000 registered electors. The members of this House receive salaries, which have varied at different times, but have recently been fixed at £300 a year.

There is also an Executive Council, which consists of the Ministers for the time being, with the Governor as President and the Premier as Vice-President. This Council meets once in each week when practicable, or oftener if occasion arises, and the several Ministers each preside over one or more departments of the administration, and are declared to be jointly and individually responsible for their actions.

All Bills passed by both Houses of the Legislature require the assent of the Governor before they become law, and in certain cases he is bound by the royal instructions to withhold assent to a Bill until it has been submitted to Her Majesty by the Secretary of State.

Local and municipal government is carried on very much on the English model by elected bodies, and considerable powers are exercised by them.

You may have heard of an agitation which has been in progress for a considerable period for the separation of the northern and central portions of Queensland into new colonies, with capitals of their own, and entirely separate from the present more populous Southern Division, in which Brisbane is situated.

The principal arguments urged are, that the interests of the north and centre do not receive sufficient consideration from, and are not well understood by, the southern members, who, owing to the larger population of the south, are in a considerable majority. Proposals for affirming the desirability of separation have been rejected in the Legislative Assembly, and the north and centre have on different occasions appealed to the Secretary of State for separation, it being understood that there is no power save that of the Imperial Parliament that could now make the separation. These appeals have not been successful, and the reply to the last appeal to the Secretary of State, which was from the central district, was to the effect that Mr. Chamberlain did not consider the time opportune for dealing with the subject.

It is presumed that this meant that this present time, when the question of federation of all the Australian colonies is being seriously considered, was not an appropriate one for the Government at home to deal with a proposal to break up one of these colonies into three separate divisions, independent of each other, and I have little doubt that Northern and Central Queensland will consent to wait until they see whether federation becomes an accomplished fact or not.

It does not come within the scope of this address to discuss the probability of a great federation being formed of the several Australian colonies or of the results of such federation. It is

evident that the actual federation will depend very much upon the details of the scheme that may be prepared. Federation has been under discussion for many years, and a scheme was agreed to by a Convention at Sydney early in 1891. The scheme was dropped, and what is now proposed is for a fresh Convention to meet, composed of ten delegates from each colony, whose scheme when prepared shall be submitted for the approval of the electors of each colony. In Queensland the Enabling Bill, as it is called, has not yet passed, though it will probably do so, but with this difference, that the delegates will be nominated by Parliament and not by the electors generally, as is provided in the Enabling Bills already passed by New South Wales, Victoria, South Australia, and Tasmania. Western Australia will probably pass a Bill of the same tenor as the other colonies. New Zealand, which is 1,200 miles from Australia, will not join in the proposed Convention.

It seems probable that in February or soon after the delegates from the six self-governing Australian colonies will meet to draw up a Constitution which, when prepared, will be open to rejection or acceptance by each colony. The principles of the Constitution will be difficult to define, for if there is too much centralisation the scheme will probably be rejected by colonies that have for long periods possessed very great power, and been presided over by direct representatives of the Crown. On the other hand, federation will be a mockery without a strong central power to deal with matters affecting the general interests.

I need say no more on this subject, but may remind you that a Federal Council has existed for several years, and has sat from time to time in Tasmania with power to deal with questions submitted to it by the colonies who send representatives: but, mainly because New South Wales and South Australia have never joined this Council, very little good has been effected by it.

I may now proceed to say something about various branches of the Administration. There is a Supreme Court of Queensland for civil and criminal jurisdiction, which is composed of a chief justice and four puisne judges, one of the latter residing at Rockhampton, and another at Townsville. The chief justice and two puisne judges live at Brisbane, and all the judges periodically visit the larger centres on circuit. In certain cases an appeal lies from the decision of one judge to a full court of three judges, on which the judge from whose decision appeal is made cannot sit. There are also three district judges who go circuit in the divisions of the colony assigned to each of them. Then there are a considerable number of paid police magistrates, and there is almost an army of unpaid justices of the peace, dispersed all over the colony.

Education in the State schools is free and compulsory, but the compulsory clauses are not enforced. There are 698 primary schools in operation, with an average daily attendance of 45,000 pupils. There are also ten grammar schools, which are subsidised by the State, but for which moderate payment is exacted on account of pupils, except from those who gain scholarships from State schools. Both the State schools and grammar schools seemed to me to be well conducted, and the education is excellent. In the State schools there is no religious education, a feature which is strongly disapproved of by many. Nearly every place of worship, however, has its own Sunday school, and there are some voluntary schools where religion is taught by Protestants or Roman Catholics. There are 168 private schools, with an average attendance of 9,400 pupils. There is no University in Queensland as yet, but efforts have been made for some years past to induce the Government to start one. The excellent universities at Sydney and Melbourne receive many students from Queensland, who after taking degrees return to their own colony.

There is no Poor Relief Law in Queensland, but there is a home near Brisbane for old, destitute, and incapable people, and there are orphanages supported by the State. Funds are placed at the disposal of magistrates or benevolent associations for the relief of urgent distress, and there are Government lunatic asylums. There are hospitals all over the country, nearly all of which I have visited. These hospitals, and a very good deaf, dumb, and blind institution, are supported by funds arising from private subscriptions, supplemented by grants from the Government. These institutions are managed by committees, the members of which are partly elected by the subscribers, and partly nominated by the Government. The hospitals are very well conducted, and I have always found the patients well cared for and well satisfied.

The Government has not been very successful in reclaiming the aborigines. They are very difficult people to deal with, and are indisposed to endure any kind of restraint, to do any settled labour, or to give up their wandering habits. There are few towns about which some of them do not hang, and these are generally of a degraded kind, and disposed to live entirely by begging. To give or sell liquor to them is a punishable offence, but many of them, if they can obtain money by begging, or by a little work, often manage to procure spirits, and some of them are addicted to opium. There are many in Northern Queensland who lead an entirely wild life, and many of whom never visit a civilised neighbourhood.

There is an orphanage for aborigines near Brisbane, and there are missions at work, but perhaps the only hope is that a portion of those brought up in the schools may become civi-

lised and remain so. As yet not much impression for good has been effected on any number of these people.

Among Government organisations or departments I must not omit the Defence Force, which is maintained at a cost of about £56,000 a year, exclusive of the portion of the permanent Queensland Artillery at Thursday Island, which is maintained at the joint cost of the Australian colonies. The force besides the staff has a strong permanent company of Garrison Artillery, with some Sappers, a Defence Force of all arms in the nature of Militia, and a body of Volunteers, with some companies of Cadets. There are also Naval Brigades at Customs ports, and there are two gunboats, not at present in commission, and two torpedo boats. There has lately been some change in the establishment, but the whole number of men enrolled, naval and military, does not much exceed 3,000.

The men of the Defence Force are fairly drilled, and do not shoot badly, but it is a pity there are not more men. Some attempt is being made to form a Reserve. For three years, owing to financial pressure, no funds were provided for camps of exercise, which are so requisite for the discipline and training of a force of this description. Camps have been formed this year, and I trust will not again be omitted.

The feeling of the men is very good, and for some months in 1891 large portions of the force were employed for long periods in the interior of the colony in preserving the peace during the great strike of the shearers, and they did excellent service.

The Police, which is a fine body of men, 800 strong, are by law liable to join the Defence Force and serve as soldiers if needed.

The Queensland Government contributes a sum of from £12,000 to £13,000 a year as its share for the support of an auxiliary squadron of Royal naval vessels sent from home in 1891 for service in Australia, in addition to the ordinary squadron. This service is provided for under a special agreement for a term of ten years.

Australia has seen no war, and I think the people are hardly alive to the evils which may come on them in that way, or to the necessity for constant readiness. The recent war between Japan and China should show Australia that there are possible dangers from the East as well as from the West. I have no doubt as to the bravery and patriotism which Australians possess, but it is necessary that the force for defence should be somewhat stronger than it is, and that it should be kept very efficiently organised, disciplined, and equipped, and, I may add, well officered, for it is not easy to obtain a sufficient number of gentlemen who will make themselves thoroughly efficient as officers in a community which possesses very few of a leisured class. It is also essential for defence to have a good reserve of

trained men and ample reserves of arms and ammunition in case communication with the mother country should be temporarily cut off.

BRITISH NEW GUINEA.

As you were addressed only last year by Sir William Macgregor on the subject of British New Guinea, the large territory over which he so ably presides as Lieutenant-Governor, it is not necessary for me to address you with respect to what may be called a dependency of Queensland, but I am pleased to have the opportunity of saying how gratified I was a few months ago to be called in by the President of the Royal Geographical Society to receive on behalf of Sir William Macgregor, and to forward to him the gold medal of the Society, for his very distinguished work as an explorer in that difficult country.

CONCLUSION.

A few lantern slides will now be exhibited of scenes in the colony which I have attempted to describe, and as this concludes my paper, I thank you for the attention you have paid, and I venture to solicit your kindly interest in Queensland, a country which I am sure we all desire to see prosperous. As in other parts of the world, some of the people are dissatisfied with their form of government, and some desire separation from the mother country, but the great bulk of Queenslanders are loyal to their Queen, and proud of being a portion of the British Empire. When the slides have been exhibited I will be happy to answer, as far as I am able, any questions that may be put to me.

APPENDIX.

The following Statistics are taken from the "Statistical Abstract, 1896" (c. 8,210):—

A FEW QUEENSLAND STATISTICS.

Area and Population (from Table 1):—

Area.	Population.	
668,497 square miles.	1881 213,525	} Exclusive of Aborigines.
	1891 393,718	
	1895 460,550	

Gross Amount of Public Revenue (Table 2, years ending June 30th):—

1881	£2,023,668
1891	£3,350,223
1895	£3,413,172

Gross Amount of Public Expenditure (excluding the Expenditure from Loans on Public Works, as shown on Table 4, years ending June 30th):—

1881	£1,757,654
1891	£3,684,655
1895	£3,308,434

Amount of Expenditure from Loans on Public Works (years ending June 30th):—

1881	£991,213	} The total Loan Expenditure of the Colony.
1891	£1,555,998	
1895	£230,120	

(The total amount of Expenditure from 1881 to 1895, fifteen years, has been £18,628,386, or an annual average of £1,241,892 8s. 0d.)

Customs Revenue (Table 5, years ending June 30th):—

1881	£530,573
1891	£1,262,398
1895	£1,144,661

Public Debt (including Debts guaranteed by the Colony, Table 6):—

1881	£13,366,400
1891	£29,578,384
1895	£31,873,934

(In addition to the amount of Debt outstanding, shown in the above table, there were Deficiency Bills outstanding June 30th, 1895, to the amount of £1,434,800, and Treasury Notes to the amount of £805,044.)

Value of Total Imports (including Bullion and Specie, Table 13):—

1881	£4,063,625	(From U. Kingdom, £2,308,695)
1891	£5,079,004	
1895	£5,349,007	

Value of Total Imports of Gold and Silver Bullion and Specie (as far as can be stated, Table 14):—

1881	£62,933
1891	£36,291
1895	£607,267

Value of Total Exports (including Bullion and Specie, Tables 16 and 17):—

Gold and Silver Bullion and Specie.			
1881	£3,540,366	1881	£930,219
1891	£8,305,387	1891	£2,116,741
1895	£8,982,600	1895	£2,290,235

Spelæological Society.—Last year a new scientific society was formed in Paris for the study of a branch of geography which has recently been greatly advanced by M. E. A. Martel, the general secretary of the new association. The Bulletin of the Society, issued quarterly, is called *Spelunca*. The first article of the statutes thus defines the objects pursued: "The Spelæological Society has been founded in order to ensure the exploration, to facilitate the general study, and to aid in the regulation or utilisation of all kinds of subterranean cavities, known or unknown, natural or artificial; to encourage and give grants towards investigations bearing in any way on caverns; and to popularise and develop researches of every kind into the interior of the Earth from the practical as well as the theoretical, the utilitarian as well as the scientific, standpoints." Incidentally, it is interesting to notice that this scientific society is licensed by the police, has to announce each meeting to the police, and is under penalty to discuss at its meetings spelæology alone.—*Proceedings of the Royal Geographical Society, April, 1896.*

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OF THE

MANCHESTER GEOGRAPHICAL SOCIETY.

THE GROWTH AND PROGRESS OF THE AUSTRALIAN COLONIES.

By Mr. W. HARPER.

(See Map.)

[Addressed to the Society on Wednesday, April 22nd, 1896.
in the Library.]

TO sketch the growth and progress of the Australian Colonies, is to sketch the career of one of the best, if not the best and brightest possession of this truly mighty British Empire.

Their progress has been steady and sure, sometimes rapid and grand. They have had their ups and downs—what country has not? True, their banking institutions had rather a rough time of it just recently; yes, and so had that venerable institution, the Bank of England once.

In the lives of peoples and nations, as in the lives of individuals, misfortunes will overtake them; and, though for the time being they suffer, and that severely, yet they are not utterly cast down, but rise afresh, with new vigour and energy, to fulfil their great mission. The study of this subject is at once most instructive and grandly encouraging, and presents one of the best examples of what can be achieved by a *free, self-governing people*. A little over a century ago, we took full possession of this vast continent somewhere about twelve to thirteen thousand miles away. What the country contained we knew not, and what it was capable of containing and producing were questions not to be once mentioned amongst us. We were not the first to discover this continent; but, having got a knowledge that such a place did exist, during the later portion of the eighteenth century several serious and highly-successful attempts were made under the immediate instructions and assistance of the British Admiralty, not only to know more about it, but also to take it over, if thought advisable, and to include it as one of the assets of the rising firm of John Bull and Co., wholesale land and country merchants, etc., etc., and so it came to be that in the process of the time appointed it became ours. Now we come to the eloquent aspect of the case, viz.—What have we done with it?

VOL. XII.—Nos. 4-6—APRIL TO JUNE, 1896.

And the answer comes, not in language merely, but in ocular demonstration—in a knowledge of the indisputable fact that yonder, under the Southern Cross, in the land of the Golden Fleece, there rises up a colossal monument to the colonising power of the peoples who make up the British stock. A monument which, in simple beauty and grandeur, the world has rarely been asked to look upon, and instinctively we exclaim, with right good will, in the words emblazoned on their coat-of-arms, "Advance Australia." Let us briefly for a short time contemplate a few of the many changes that have taken place.

Is it at all essential to point out here the fact that the original proprietors of the country have been a rapidly decreasing number since the white fellows set foot upon its shores? In some of the colonies there are very few, but in the northern and less-populated portions they still find a home and exist in considerable numbers. They are, however, comparatively harmless, and easily kept in check if need be. We have done very little to transform the black fellow, for the simple reason that he will not; but with the black fellows' country, ah! that's a different matter. Where brush and scrub reigned supreme, there now is visible to the eye palatial buildings, wide streets, magnificent cities, many large towns, and thousands of homesteads and villages; inland rivers, five to over a thousand miles long, which at one time carried the frail craft of the aboriginal, now carry produce from place to place, and fertilise the plains, supporting millions of sheep and cattle. Its hills and mountains which contain the precious metals are being turned to such an account that Australia has become the greatest gold-producing country in the world. Since gold was first discovered in 1851, until the present time, the total value of the output has reached the enormous sum of £400,000,000 (*vide* "The Financial Times," of October, 1896), nor does there seem any appearance of the output lessening: in fact, quite the reverse. Where any serious attempts have been made they have invariably met with success. But this is not the only change. Material success is not always the true test of progress. What of the people?—yes, they will stand inspection; it is they, with their ability, their knowledge, their perseverance, their character—it is they who have brought about the change, and by continued plodding, living under circumstances which are made by those in authority as helpful as possible, to the fullest developments of their country—the land of their adoption—they have laid the foundations of the Colonial Empire. One vast important fact should be very clearly kept before our minds, and it is this—that peace and tranquillity has reigned supreme ever since we began to settle there. The thunder of cannon, the marching of troops, the burning of villages, has not darkened the pages of their history. Of no other possession of the British Empire can this be said; or, if so, certainly not to the same extent.

Now, in order to appreciate all this, let us begin at the beginning, or near it. Most of the shores around this island, and possibly part of the mainland, were known to the Dutch and Portuguese as early as the middle of the fifteenth century; but in order to preserve a monopoly of trade they kept their discoveries a secret, and no maps were published. In 1770 Captain Cook was despatched by the Royal Society to watch the transit of Venus in the South Seas, Australia being considered a "No Man's Land," liable to seizure and appropriation by any

nation. He sighted land in April, 1770, and landed at Botany Bay—a place since made famous in history as being the place selected for establishing the first penal settlement.

Sailing again, he passed up the eastern coast, visited Moreton Bay, which he named after the President of the Royal Society. He landed at Port Curtis, Port Dennison, Cooktown, on the northern seaboard of Queensland, and finally, before leaving, he formally took possession of the whole continent in the name of George III., and called it New South Wales.

No further notice seems to have been taken of the country until the year 1786, when the British Government were perplexed to know what to do with the mass of criminals who were accumulating in the prisons, transportation to America having stopped after the Declaration of Independence. It was determined to give the new country of Captain Cook a trial, and, consequently, in May, 1787, a fleet left Portsmouth, consisting of H.M.S. "Sirius," the armed tender "Supply," six transports, with 750 convicts, and three store ships. After a passage of eight months they arrived safely at Port Jackson, and on the 26th January, 1788, landed, and formally founded the colony, Captain Phillips, who commanded the expedition, becoming the first governor. A nice little lot, you say, to lay the foundation of a country; yet there are not a few men in first-class positions to-day, a credit to themselves and to the colonies, who came from such parent stocks. Many are the thrilling stories told of these early settlers and of their experiences with the blacks, and the various accounts of the adventures of those who were sent to explore the country.

Although in possession of the country, we knew nothing further; to what extent the country was peopled, what it contained, or even what the country was like. This was the work of years, of difficult and dangerous journeyings, and sometimes with the price of a life. Time does not permit of our considering in minute detail the various stages of this country's progress. We must content ourselves by passing briefly in review the most important of them.

The convicts with their attendants, and the aborigines, were left in full possession of the country for years, until such times as the climate and the land of the country were better understood; immediately this was accomplished, white populations from the Old Country began to settle.

New South Wales, as we now know it, is the second smallest of the group. It contains 309,175 square miles, and in 1891 had a population of 1,132,234, being the oldest and smallest but one. Its general or uniform progress has been more rapid—the country is more peopled, the lands have been more taken up for selections and grazing farms.

On making our first acquaintance with Sydney, its capital, if going by steamer, we enter it through high headlands to either side of us, and shortly find that we are entering into what is admittedly the finest and most beautiful harbour in the world—unlike the harbours in some of the other colonies, vessels of any size can come right up to the wharves and discharge within a stone's throw of the main streets. About the truest descriptive comparison of this fine gift of nature I can give you is to ask you to imagine some of the lakes and lochs in the west of Scotland combined in one, and a few of the watering-places

dotted here and there, especially along the right bank. The people of New South Wales, and especially the Sydney colonists, are very proud of their harbour, and it forms the theme to ask questions and opinions upon to an unlimited extent. I ought to point out here that the Government of this colony have not left the sea-shore open to an invader, but have spent large sums of their own exchequer to have the heads at the entrance thoroughly fortified.

On arriving in Sydney we have reached one of the two finest cities in the southern hemisphere; and one is struck with the enormous development which has taken place; everything is modern and up to date, far more so in some respects than Manchester. First, it has a superior climate; certainly it is a bit warm in summer time, say from the beginning of November till the end of January, but the other nine months of the year are such as to fully compensate for the inconvenience or discomfort of the other three; and one of the principal, if not the principal, factor in its success, is the simplicity of method, the favourable opportunities, and their whole system of land purchase and transfer.

Amongst the finest buildings are those of a public character, such as the Government Post Office, the Town Hall, and the Centenary Hall, containing the largest and finest organ in the world. This building was opened just to celebrate the success and achievements of these hundred years. The various places of business, especially the large wholesale dry goods stores, are worthy of high commendation, banks and insurance institutions being right in the front.

According to Max O'Rell, in his "John Bull & Co.," Sydney has also the finest hotel. He says that the Australian Hotel in Sydney is the finest and most comfortable he knows in all his travels. Public parks, botanic gardens, museums, picture galleries, are much in evidence, and religious bodies, free and unfettered, prosecute their work all over the colony with marked zeal and persistency.

The buildings of the city are divided into three classes, viz.—*wood*, *brick* with cement facings, and *stone*: this colony is fortunate in having large quantities of fine building stone. Many of the large buildings in the various cities of the colonies are built of brick, and beautifully faced with cement; this is accomplished mainly, I believe, because there is little or no frost to destroy such style of building.

The squatting industry of this colony may be said to have its birth in the efforts and success of two "brither Scots," Messrs. Grant and McArthur: to what proportion it has now reached may be judged by the facts that in 1891 the pasture lands of the colony were carrying 56,000,000 sheep and 2,000,000 of cattle, to say nothing of horses.

From the date of its foundation until 1893, New South Wales existed as a Crown colony; but the white population so increased in numbers, wealth, and importance, that, as the result of repeated representations to the Imperial Government, it was granted a charter, and a Legislative Council was created consisting of thirty-six members, twenty-four being elected and twelve nominated by the Crown. In 1853 a further advance took place; the Constitution Act was passed, introducing responsible Government, and was agreed to by the Imperial Parliament in 1855—thereby establishing the principle that in order to the success of peoples or nations their full share in their

own government is essential, that de-centralisation of government, carrying with it power and responsibility, is one of the fundamental principles in the laws of nations. No one played a more prominent part in the accomplishment of these things than our fellow-countryman, Dr. D. Lang. Dr. Lang was a Presbyterian minister, and through his early associations with the colony was led to take his full share in the then burning questions; he was one of the first legislators. A magnificent monument is erected to his memory in the Public Gardens in Sydney. With the exception of Sir H. Parkes, he was one of the finest statesmen of the colony. The population of Sydney at the last census was about one-third of the whole population. The colony has 65 boroughs and 19 municipal districts; the distance by rail to Melbourne is 576 miles, and the time occupied in performing the journey is about 18 hours. Railway communication has been established through a great part of the colony, although much in this way has yet to be accomplished. They have at present open for traffic 2,182 miles; they have telegraphs of 23,689 miles extent. The land under cultivation producing crops is 1,241,419 acres. The wool export for 1892 was 240,000,000 pounds. The total imports and exports were £44,000,000. The national debt at present is about £48,000,000 sterling. The estimate of black population is 5,000.

One very important mineral, which is producing considerable wealth, is coal; this colony produced 3,000,000 tons the other year.

One of the most important subjects that any country has to turn its attention to is that of education, and that, I am glad to say, is the view taken by all the colonies, and although the systems in the various colonies slightly differ they partake largely of similarity; upon this matter they are thoroughly agreed, and to it they give their very best attention. Perhaps the largeness of the Scotch element in the councils of the colonies has something to do with it; I am of opinion that it has. In each of the colonies it is a department of the public service, and is represented in the Cabinet by a Minister, who is responsible for its welfare, and watches over its interests. Education is, I believe, compulsory in all the colonies, the ages generally being from six to thirteen or fourteen years. In New South Wales, South Australia, and West Australia small fees are charged; in the other colonies it is free. Sydney has reason to be proud of having a very fine University, where many successful men of business have been trained. It has also a Royal Mint, where gold bullion is manufactured; in 1893 they turned out three millions sterling.

Transportation to this colony was abolished in 1840. While all this success was attending the people of New South Wales a considerable population had settled in the southern portion of the colony, and especially after the gold discoveries, people literally poured into it; and so it came to pass that in 1851 the colony of Victoria was granted a separate existence, and a Constitutional Government was appointed, Melbourne being the capital. In 1803 one of the name of Collins made the unsuccessful attempt to do something in the way of colonising (near where Melbourne now stands) by a convict party, but shortly abandoned the attempt. The first successes were achieved by a family of pioneer colonists from Tasmania, of the name of Henty, who landed with stores and implements in November, 1834. They were followed

in close succession by others from the same island, and several parties arrived the following year. Westgarth, in his "Fifty years of Australian Progress," says, "Fawcner followed them (that is, the Henty family) in October, 1836, and by his vigorous practical procedure opened up in its central part that colonisation of the future Victoria which the Hentys had begun the previous years at the western doorway. Bateman landed in May at Indented Head, where he made a temporary settlement, and shortly afterwards traversed the country of the present Melbourne and its northern suburbs, making on the 6th June a treaty with a number of the natives at a place on the Merri Creek, only about two miles from Melbourne. But the founding of Melbourne arose out of Fawcner's action, for his party, in obedience to orders to settle only where there was abundant fresh water, having found this requisite above the Falls, squatted down there in consequence, and there accordingly, whether for better or for worse, arose the modern capital of Victoria, and the worthy rival of its senior, Sydney, for the metropolitancy of the Australasian section of our empire, and Fawcner is to be regarded as the founder and father of Melbourne." A more hopeful beginning certainly than that of Sydney. The size of Victoria is less than a third of New South Wales, it contains 87,884 square miles, and the estimate of population in 1891 was 1,146,405, or nearer 20,000 more than New South Wales; the population of Melbourne being about 400,000. The breaking out of the gold diggings, especially those of Ballarat and Sandhurst, were the main factors in attracting so large a population in so short a time. Melbourne cannot boast of a Sydney harbour, but she possesses some things which Sydney does not. One is the beauty and symmetry of plan upon which the city is built, and another is the splendid system and supply of tram-cars; a finer, or even equal, I have yet to see. The traction is by cable, and as you observe those cars journeying through the principal streets, none of which are less than 99 feet wide, splendidly laid out, all running at right and left angles, it is certainly a pretty sight. The climate of Victoria is not so warm as that of New South Wales, but they are much troubled by hot winds; as Melbourne is largely surrounded by water, gentle, cooling breezes are the companions to these hot days. The suburbs of the city are very fine, and there are some fine watering places, such as St. Kilda, the Brighton of Victoria. Here, as in New South Wales, at the entrance to Port Phillip, which is the navigable waterway to the harbour of Melbourne, military fortifications are in evidence, also submarine cables are largely used, to be in readiness if occasion required.

The city of Melbourne takes its name from the late Lord Melbourne, who was Prime Minister when the city was founded. Like the other colonies, pastoral pursuits engage the attention of capitalists very largely. In 1836 the live stock was, horses, 75; cattle, 155; sheep, 4,000; in 1891 it was, horses, 436,459; cattle, 1,780,000; sheep, 12,000,000.

Amongst the finest buildings in Melbourne are the Houses of Parliament, which cost something over a million sterling, owing to the price that has been paid for land; it is not uncommon to find large blocks of properties six to eight storeys high. As the population has grown so has the trade and commerce. In 1851 the exports and imports were

from 2,000,000 to 3,000,000; in 1891 they were 37,000,000 sterling. During the years of the gold industry Victoria has produced gold to the value of £227,357,436, and the mining plant employed is valued at £2,000,000.

The education of this colony is compulsory and unfettered by denominationalism; it is spending nearly £650,000 annually and has nearly 2,000 schools (96 per cent attendance). It has also a splendid University, founded only two years after the colony was established; it has power to confer all degrees except that of D.D. The two Houses of Parliament are both of an elective nature, the Upper House consisting of 46 members and the Lower House of 95 members. The electoral qualification for the Upper House is by franchise; the Lower House is by manhood suffrage; qualification, six months' residence. One important industry to be noted before passing from our notice of this colony is that of vine-growing; 20,000 acres of land was given over to the grape, producing 2,000,000 gallons of wine. It has also a branch of the Royal Mint established, which is presided over by Mr. Geo. E. Anderson, one of the late M.P.'s for Glasgow. There were open for traffic 2,763 miles of railway, the distance to the capital of South Australia, Adelaide, being 500 miles by rail.

Let us now consider briefly some of the features of South Australia. This, the second largest colony, was established under totally different conditions to that of any of the other colonies. It was founded by the South Australian Colonisation Society, with certain conditions and reservations as to the selling of the land. This was in 1836. This scheme totally collapsed in three years, and in 1856 the colony was endowed with a Constitution on a basis similar to the other colonies. Progress has been slower in this than in any of the other colonies, the reason being that many hundreds have been attracted there for health and not wealth as in that of other colonies. The climate is one of the finest of the group excepting, of course, that of the northern portion.

The total area of the colony is 903,690 square miles, or 578,361,000 acres. In 1845 the population was 21,579; in 1891 it was 320,431. Agriculture and pastoral pursuits are the chief sources of wealth, the former especially. In 1891 there were under cultivation 2,700,000 acres. The stock on the stations, cattle, 500,000; sheep, 7,500,000. Railways open for traffic, 1,666. Telegraph wires being worked, 12,000 miles. It is from Adelaide that the telegraph to this country begins, going overland to Port Darwin, 1,973 miles. As showing the quantity of wheat grown in this colony, there are no less than 85 flour mills, and in 1890 there were over 2,000,000 acres of wheat under cultivation. Another industry more largely developed in this colony than in any other is grape cultivation; in 1890 they manufactured 225,000 gallons of wine. Copper is a valuable mineral found largely in this colony; in 1890 the value of the output was £226,992. It is at Largs Bay, a distance of seven miles by rail from Adelaide, that all mails to and from the colonies and this country are despatched, excepting those of Queensland, some of which are despatched *via* Torres Straits. The city of Adelaide is very prettily situated, surrounded by hills in the background covered with vine-groves. They also have here the finest botanical gardens in the southern hemisphere. Their Houses of Parliament are very fine buildings,

and to travellers are the object of much admiration: the city generally is flat and the streets wide, running at right and left angles. They have also a university, largely gifted and endowed by two colonists, Sir Thomas Elder and Mr. Hughes. As my time is fast fleeting, I must now ask your consideration of the various claims which Queensland has to put forward in order to merit your admiration. She was the last but one of the group to find a separate existence, but that is by no means her place in point of importance. Her success through various causes and reasons has been the quickest and most remarkable of the group. In 1825 the colony was declared a settlement for convicts, and this was continued for fifteen years. In 1840, therefore, transportation ceased, and in 1848 the first emigrant vessel arrived in Brisbane with 240 emigrants.

Queensland was granted a charter and proclaimed a free and independent colony in 1859: the capital was called Brisbane, as was also the river upon which the city is built, in honour of another Scot, Sir Thomas Brisbane, who was Governor of New South Wales when the colony was founded—when separation was granted. The population was 25,000, in ten years it rose to 115,567; in 1858 gold was discovered near Rockhampton, and in 1863 the colonists began to grow sugar all along the coast lands as far north as Mackay.

The size of the colony is 668,597 square miles, or about 428,000,000 acres. The distance by sea to Sydney is 510 miles, to Melbourne 1,074. The capital of this colony, Brisbane, is situated on the river bearing its name, and in this situation resembles Glasgow, the city being built extensively on both sides. The river rises up in the country in a southerly direction about twenty-five miles from Brisbane, and runs into Moreton Bay, about fifteen miles, to the Pacific. This colony has much in itself different from any of the others, and is capable of producing much that the others cannot: one of the principal features being the difference of climate, of which there are at least not less than three, and each and all of them differing from those of the south. For example, take the sugar industry, a few years ago there was invested in the various sections of this industry about £25,000,000, giving a large employment to blacks and whites. Victoria alone took sugar in 1893 from Queensland valued at £300,000. Fruits of all sorts grow splendidly: there is nothing in this branch of horticulture that can be grown either on a low or tropical climate that Queensland cannot produce. Arrowroot is grown very extensively in certain districts, as also the tobacco plant.

The great channels of wealth, however, both natural and acquired, are stock, agriculture, and minerals, and Queensland has acquired the distinction of being the greatest gold-producing colony of the group. She has also the proud possession of the greatest gold mine the world has ever known, viz., Mount Morgan. This mining colony was established in 1886, with subscribed capital of 1,000,000 £1 shares, and has risen in market value as high as 17,500,000. It has been a success from its discovery, and has never ceased paying dividends. It reached high water mark when in 1891 it paid £1,100,000 in dividends. The gold is very fine, and is worth £4 4s. an ounce. The machinery is the very best, valued at £120,000, and is capable of crushing 1,500 tons weekly. In 1893 84,359 tons were crushed, yielding 143,795 ounces,

valued at £575,180. The importance of this industry may be best understood by the following: in 1891 576,439 ounces of gold were obtained, valued at £3,105,756. The Government geologist, Mr. Jack, says that gold has been found in every part of the colony, from Warwick in the south to the Gulf of Carpentaria in the north; as Bendigo and Ballarat assisted materially to flood Victoria with population, so have the gold fields of Gympie and Charters-towers Companies. Take the latter of these as a case in point, the population about fifteen years ago was a few hundreds, it is now a population of over 16,000; it had in 1891 113 registered companies employing 3,000 miners; five of the companies paid in dividends £182,000. The output that year was 222,882 ounces. What has been said on this subject must suffice as an instance of what is going on all through the colony, in a greater or smaller degree. Silver, tin, copper, and lead are also worked in some cases most successfully. Coal is also produced to a very large extent: those who have made careful surveys say that the supply is unlimited.

Now a short attention to the great pasture industry, and please prepare your minds for some surprising figures. We talk of our landed gentry and **their** estates, they may have it in value but not in extent. Another advantage our Queensland squatter has, if he is not squatting on leasehold—if the land is his own—he is at once able to produce his title deeds for his property, a rather difficult thing, I am afraid, for some of our landed gentry. Some of the best and largest stations are those in the western portion of Central Queensland, and the Darling Downs towards the borders of New South Wales. Some of the large stations are in the hands of companies. Let me take a few in Central Queensland as examples of what is to be found in the centre of this part of the country; near the township of Aramac is the head station of Messrs. Fraser and Collier, the size of which is 160,000 acres; Saltern Creek Station, of Weinhold Brothers, pastured in 1891 200,000 sheep, and at Bowen Downs in 1891, 260,000 were shorn.

Arising out of this large number of stock and the efforts to find a market outside the borders of the country, has sprung up and developed largely the meat freezing and exporting industry. Thirteen establishments are at present at work. The three large freezing works situated at distances apart from each other, viz., Brisbane, Rockhampton, and Townsville, are capable of dealing with 195,000 cattle and 500,000 sheep annually; the value of meat exported in 1891 was £246,316.

Wool is the profitable product of the pastoral interest, the value of this export, together with tallow and hides, being £3,738,741. Time fails me to say anything further regarding this colony, which will at some future date be divided into three separate colonies, namely, Northern, Central, and Southern Queensland.

In closing this portion of my lecture, let me say a few words about Brisbane. Brisbane, although possessing some beautiful buildings and a few fine streets, splendid shipping accommodation, and a fine class of people, is not so advanced as some of the older cities; but has within itself the vital elements of greatness which only want time to develop. Life here, as elsewhere, is largely spent outside; every boy can ride a horse and play cricket, the climate of the colonies being such that too much time spent indoors would be burdensome. The people are most hospitable, and the greater portion of the colonists are Old

Country people. The institutions, social and religious, are much as we know them.

Scotch Associations are in strong force throughout the colonies and in Brisbane: there is a splendid lot of Volunteers, by name the Queensland Scottish: their uniform is that of the Gordon Highlanders, and their music is the pipes. We had a vigorous Scotch Association in Brisbane, permanent rooms and paid secretary, who devoted his time entirely to its duties. Another day kept in remembrance was Glasgow Fair Saturday, the Glasgow folks having for years held a splendid social and musical.

Before leaving our consideration of Queensland, permit me now to draw your attention to what is known by the name of the Kanaka Labour Question: this is one of the questions which this colony has had to settle apart from the others. With the Chinese immigration question it is not so. That affects all the colonies, or the majority of them. The Kanaka labour question differs from the Chinese question not only because it is confined to one particular colony, but because it is confined to one industry, namely, the sugar plantations of Queensland. These two have been almost inseparably linked together, and in the opinions of those best capable of judging will remain so. As I have said in a previous part of my lecture, sugar growing and refining is largely cultivated in the lands between the main range of hills and the coast in Central Queensland. The climate here is at some seasons very hot, from 90 to 120 degrees in the shade, and as it is thus tropical in its nature, it is almost impossible to get white men to work on the plantations. Failing to get a supply of white labour, the planters petitioned the Government to assist them in finding labour, and it was decided to recruit the supply from the South Sea Islands in the Pacific. Two factors in the case led to this decision. First, the fine healthy physique of the boys and their willingness to work, and their being accustomed to a hot climate. But it must not be supposed that the planters were allowed to do just as they liked in this matter: nothing of the sort. The importation of these Kanakas was conducted directly under the supervision of the Government, no kidnapping being allowed, it being distinctly defined that every person should have explained to him the nature of his employment. In this, however, as in the best of systems, this proved no exception, and serious abuses crept in, and doings in connection therewith might fill a dark page in history. Until a few years ago the two great parties in the State were divided upon this question, one party, led by Sir Thomas McIlwraith, K.C.M.G., being in favour of it, and the other, led by Sir S. W. Griffiths, K.C.M.G., now the Chief Justice of the colony, opposed to it: his contention being that white labour was equal to the task of carrying on the important industry.

At the General Election of 1887 this was brought forward as one of the questions of urgent importance, largely through the exposure of certain treatment which had been meted out to a party of Kanakas. The result of all this was that Government decided to stop the traffic, and recruiting forthwith ceased, the boys being returned as soon as their engagement ceased, which was three years. The nature of the engagement and its conditions, binding upon all parties, was something like the following: No Kanaka was allowed to engage himself until a

duly qualified doctor, who accompanied each vessel, certified to his fitness; the engagement lasted three years, with the option at the expiry of that term of re-engaging. They were not allowed to engage in any other work, such as station men, thereby not entering into competition with white labour. Their food supply was according to a bill of fare approved by Government, and as police magistrates are in evidence even in the smallest of villages, every opportunity was given them of reporting any unkind treatment. Their cost of transit to and from their native land was borne entirely by the planters who engaged them. In the course of a few years, as the time of engagement expired of those on the plantations, and no white labour was forthcoming, the Government who had yielded to the cry "This is a white man's country," were face to face with this aspect of the question, either the extinction of the sugar industry or the re-introduction of black labour. A Coalition Government was in power in 1890, and Sir S. W. Griffiths issued a manifesto renouncing his previous opinions, and stating that the Government had decided upon its re-introduction. Every safeguard has been provided to prevent abuses of the system. It would be unfair were I not to say here that perhaps the greatest authority on the New Hebrides is opposed to this traffic, viz., the Rev. J. G. Paton; but others having long experience both in the New Hebrides, and as workers among the Kanakas on the stations testify to the good they receive. Everything is done by different denominations to bring them under a religious influence. Evening schools are held, and many of them have carried back to their homes a capital rudimentary education, religious impressions, and attendant virtues.

Let us now consider, and that briefly, the few particulars regarding the colonisation of Western Australia.

This is by far the largest colony of the group, being in extent no less than 975,876 square miles, with a coast line running up the entire western side of the colony, to the extent of 3,000 miles; or, to put it thus, one-third of the continent. The largest portion of this colony is as yet of an unknown nature, and will remain so for many years to come. The date of its birth and the beginning of its importance was practically when it was declared a free and independent colony, and granted a constitution as the other colonies. Growth to any great extent under any other conditions is bound to be slow and stunted. The vitality is not there, the varied opportunities are wanting, and everything tending to progress and development are checked by the cloven hoof of a Crown Colony—it was especially so in this case.

The progress in opening up portions of the colony by means of roads and railways, the discovery of gold to such an extent, and the large quantities consequent upon the investment of such immense sums of capital—in fact, it has been literally flowing in—gives us reasonable ground for believing that this colony will, at no distant date, out-rival all the others in respect to the output of this precious metal.

This colony then sprung into existence and prominence in 1890—in extent it is equal to one-half of European Russia, or one-quarter of the whole of Europe. Convicts were being sent to this colony as late as 1868, in all 9,718 had been sent. The population in 1894 was 82,000, in the capital (Perth) the population was 15,703.

In this colony we become acquainted for the first time with rail-

ways owned other than by the State. They have five such opened at present; the oldest and most important is that connecting the capital with that of the magnificent harbour, King George's Sound, and the port and town of Albany. The terms and conditions being altogether different to what exist in this country. Although for the present precious metals are the principal sources of wealth, squatting and pastoral pursuits are being followed to a considerable extent.

In 1894 the lands leased from the Government were carrying about 2½ million sheep, and the wool export for the same year was valued at a quarter of a million.

There are two sources of ever-increasing wealth to this colony peculiar to itself, viz., the exportation to India of sandal wood, and of Jarrah timber to this country and elsewhere for wood paving, railway sleepers, etc.; the value of these exports in 1894 was over £100,000. I ought to mention here that the great waterway to this colony, viz., King George's Sound, is being very strongly fortified, partly at the expense of the Imperial Government and the various Governments in the colonies. This is looked upon not merely as a matter affecting one colony only, but the whole; it being a probable point where an invading force might gain a landing. One other item of difference in the laws of this colony in comparison to the others, is the slight assistance they give to a few private day schools. The education is, however, of a National character, there being 116 Government schools and 21 private.

Speaking generally, their constitution and laws are similar to those of the other colonies. Both Houses of Parliament are on an elective basis.

The Chinese question, as I have already indicated, and as you will readily observe, is one which is common to all the colonies, especially Queensland, New South Wales, and Victoria, the other two colonies not offering the same inducements to the Celestials. In one aspect this question assumes an Imperial character, and must be treated as such. But first let us consider it from the point of view of the colonial wage-earner and statesman. That there is a strong antipathy to the Celestials is apparent to any one who has lived in these colonies, and in some respects there is good cause for this. Firstly, the best class of Chinamen do not seemingly come from their own land, only a few of them; those that do come, therefore, are not of the representative type. There are many individual cases, some of them coming under my own observation, of splendid upright business men, and good citizens, but the vast majority are not of that sort. One reason why his presence is so obnoxious is that he is practically the only foreigner, it certainly makes him more conspicuous; then again, he has no intention of settling down and making the colonies his place of abode, his one and only object being to make money and clear out as soon as possible. As colonists, therefore, they are no good; they fail to perform the ordinary duties of citizens; they have nothing at stake and no interest in the country; their modes of life are very objectionable, and they strive to live on a mere pittance. Sir H. Parkes, speaking upon this subject in the House of Assembly, in Sydney, a few years ago, said: "In the agitation against the influx of Chinese, which is common to all classes of the working

population, there are forces which the superficial observer is likely to overlook. Every mother of a working man's family is an uncompromising opponent, and every child imbibes the same feeling of resistance and denunciation from its parents. No outlook is possible to the humble household dependent upon daily labour which is not obscured and rendered less hopeful by the contingent intrusion of the Chinese. Where moral principles and provident habits prevail this feeling is probably strongest. How could it be otherwise? It will not be denied that it is meritorious to the poor to do the best they can for their offspring. How can their 'best' in the struggle of life be assisted by the intrusion of hordes of men who are foreign to them in language, religion, notions of law and all the usages of their state of society, and who are of a servile race? It is mainly because the influx of Chinese, or of other persons of any inferior nationality, is a disturbing cause to social peace and contentment that it should not be tolerated."

During the time the House of Assemblies were discussing the provisions of the new Act of Parliament, and also cabling to the Secretary of State for the Colonies, four ships, with no less than 600 Chinese on board, were lying in Sydney Harbour, permission to land being refused; a portion of this lot had also been refused a landing at Melbourne, from whence they had come. The laws as they exist fix a heavy poll tax on all Chinamen landing in any of the colonies. There is a strong feeling amongst the colonials, both old and young, especially the latter, that the colonies (being 97 per cent purely British) should remain so. The Imperial aspect of this question is easily disposed of. Certainly complications might have arisen, but as the colonies are not consulted when treaties and obligations are entered into, they certainly will never allow their interests to become subservient to any treaty which may conflict; so that in this, as in other cases, if the Colonial Minister should overlook the claims of the various colonies, individually or collectively, they have arrived at that stage when they are capable of looking after them themselves. In drawing my lecture to a close, let me call your attention to some of the essential differences in the laws which govern these colonies generally and some of the laws we live under in this country. Firstly, and without the slightest hesitation, I place the Land Laws. To my mind theirs is the far superior of the two, and for this reason, that the lands of the colonies are not locked up in the hands of the few; the buying and selling of land goes on as freely and unfettered as cotton on the Manchester Exchange, and anything like ground rent has, to my knowledge, never been allowed a place, for any person who has land to sell offering it on such conditions would be to make himself a laughing-stock. Everything possible is done to get the people settled upon the land. Every facility to settlers either to purchase through time payment or a leasehold from the respective Governments, always, of course, complying with the conditions. Personal residence is one of the essential conditions, thereby making absentee landlordism well nigh impossible. Supposing a person with an estate in the outskirts of Sydney, Melbourne, or any of the other cities or towns, wished to sell it in lots for building plots: first it would be surveyed, the Local Board would then step in and decide the streets, the land would be offered by public auction in building lots, and hundreds of people would then come for-

ward and purchase their freehold. No other system would, I am sure, be tolerated; the system of land transfer can be used very cheaply and expeditiously. The result of all this is that the land is as much a marketable commodity as butter and eggs.

The result of this is found in the thousands of thrifty people, not to speak of the wealthier classes, who are the proprietors of their own houses.

The second difference I will draw your attention to is "education"; various systems have been at different times adopted, all of them having been abandoned in favour of a complete national system. As I have already pointed out, the colonies are fully alive to the importance of good education, and they have made ample provision. One system which had a place in New South Wales and South Australia was the endowment of private schools. As the other colonies observed the failure, and the time arrived to found systems of their own, they never made any attempts upon those lines. Every religious body that exists is to be found there, and in the matter of religious instruction it seemed impossible for all to agree; it was decided that no religious instruction of a definite character be taught in the schools, but that every opportunity be given to any to use in all the colonies the schools for such a purpose after the regular hours.

The State has therefore taken upon itself to provide primary and secondary education for the youth of the colonies, untrammelled and unfettered; the management of the schools being vested in local bodies elected for that purpose.

I ought to mention again the splendid Universities of Sydney, Melbourne, and Adelaide.

Another free institution is the Church (I speak of it as a whole). Religious bodies at the early stage of the colony's experience (in New South Wales) did receive monetary assistance, but that has long since been abolished. And to say that religious institutions, life, and work, have suffered in consequence is nothing less than an insulting slander upon these colonies. To my mind it has had quite the opposite effect, and has indeed done much to produce the efficiency of the various churches there, and has effectually stopped all jealousies. Yet another advantage they have over us, and it is this, the statesmanship-like way in which they have disposed of the Drink Question. Let me take Queensland as a case in point. There is not in the whole of that colony what we commonly know as a "public house." Hotels must be able to supply bedroom accommodation according to the size of the house. Residence by the licensee is also essential, as a guarantee of the house being properly conducted. But a licence cannot be got by simply complying with these conditions; the voice of the people of the district has first to be heard, and their judgment is final. My personal experience here in Queensland as to the operation of local option entitles me to contradict those who say that wherever it has been adopted it has been a failure: to my mind it has been a complete success, and generally gives satisfaction to all parties.

They have also had here, as in Scotland, Sunday closing, and I never knew of any serious agitation for a change.

There is one serious difference that exists, and with which I do not agree, and that is the fiscal policy of the colonies. Their present

method of raising taxation (and that is the special reason for its adoption and retention) is through the Customs House; true, they have the desire to foster native industries, but that, I contend, is only a secondary consideration. New South Wales flourished under free trade, and established industries, and so may the others. One difficulty to be contended against is the high rate of wages paid there in comparison to here, and in many cases the cost of carriage to the colonies is not sufficient to make up the difference. But why should the colonists attempt to carry on manufactures by artificial means or subsidised at the expense of the whole population? The commercial importance of Australia does not and will not exist for many years in her manufactures, but in the products of the earth, minerals and precious metals, and the fruit of the land, such as stock and crops in abundance. These are what she is bringing to the open markets, and, as time goes on, bringing in still greater quantities, and in future she will get the other commodities she desires. The progress generally of Australia is, I believe, beyond the most sanguine expectations, and, although east down, she is bound to go ahead and flourish; there is nothing to show to the contrary. What the colonies want is a largely increased population of thrifty emigrants. Labour generally in the country is plentiful; there are not so many thriving parasites in proportion as here, and every one is of some material value to the State. It seems to me that all the true elements of greatness and material prosperity are to be found there; the people are thrifty and industrious; the opportunities of success are in many cases more numerous, the competition in some forms of labour not being so keen; and another most important factor is the one I have already mentioned, that the people are of ourselves to the extent of 97 per cent, so that the Governments have not their minds exercised towards the keeping in check of the native tribes; they are thus left to the devising and superintending the best methods of developing their adopted and home land. If time permitted I could quote figures to any extent showing the growth of progress of the colonies during these fifty years; but time does not permit, excepting to a small degree. Now, you must not suppose that this has been accomplished as by the waving of a magic wand, and nothing would give you a conception of the up-hill battle of the early settlers; the struggle for liberty and freedom, the many misunderstandings with the Imperial Parliament. It was only after strong protests and a determined attitude upon the part of the colonists of New South Wales that the Imperial Parliament ceased to dump down convicts in that colony. Many instances could be cited, and it is through instances of that sort that the rising Colonial looks with a degree of suspicion upon the Mother Country.

Still they are loyal at heart—cite the sending of troops to Egypt, and the following. At the present time they have nearly 18,000 troops, including volunteers, and these maintained at their own expense. The population of the colonies in 1891 was 3,058,417. They have spent over £100,000,000 in railways, yielding an annual revenue of nearly £9,000,000. Miles of railways opened for traffic, 10,500. The total indebtedness of the colonies is £160,000,000.

The annual volume of trade, both imports and exports, is £120,000,000, or £40 per head of the population.

THE MESSAGE FROM AUSTRALIA.

AUSTRALIAN LOYALTY TO THE EMPIRE.

Sydney, Sunday, January 12th, 1896.

The Hon. G. H. Reid, Premier of New South Wales, has despatched the following cable message to Lord Salisbury:—

From the Prime Minister of New South Wales.

The Governments of Australia and Tasmania view with satisfaction the prompt and fearless measures adopted by Her Majesty's Government in defence of the integrity of the Empire. We desire to convey our united assurances of loyal support. The people of Australia are in full sympathy with the determination of the mother country to resent foreign interference in matters of British and Colonial concern.—Signed, on behalf and at the request of the Governments of New South Wales, Victoria, South Australia, Queensland, Tasmania, and Western Australia, G. H. REID.

LORD SALISBURY'S REPLY.

The following reply has been addressed by Lord Salisbury to the telegram sent by the Hon. G. Reid on behalf of the Governments of New South Wales, Victoria, South Australia, Queensland, Tasmania, and Western Australia:—

Her Majesty's Government heartily thank you, and through you the Governments of Australia and Tasmania, for your patriotic assurance of sympathy and support. Nothing can give us greater confidence in maintaining the rights of our country than the knowledge that we have the full approval and good will of our fellow-subjects in the great colonies of the Empire. SALISBURY.

THE DEFENCES OF NEW ZEALAND.

Mr. Seddon, Premier of New Zealand, states (says the Melbourne correspondent of the *Times*) that the colony is fully equipped to resist any invader.

RELIGIOUS DENOMINATIONS IN AUSTRALASIA.

According to the religious census of Australasia the following are the numbers of adherents of the principal denominations:—Church of England, 1,488,306; Roman Catholics, 799,824; Presbyterians, 493,483; Methodists, 463,097; Congregationalists, 79,434; Baptists, 87,185; Lutherans, 76,432; Salvation Army, 42,813; Jews, 12,818. The proportionate rate of increase since 1881 has been:—Congregationalists, 31·83 per cent; Roman Catholics, 32·20; Presbyterians, 34·45; Church of England, 38·05; Baptists, 42·88; Methodists, 51·21. In all the colonies except South Australia and New Zealand the Church of England outnumbers all other Protestant churches. In Tasmania more than half the people belong to the Church of England. The Presbyterians are most numerous in New Zealand, where they number nearly one in four. On the other hand, in South Australia they are only one in seventeen.

COMPARISONS OF INCOME AND EXPENDITURE PER HEAD OF THE
POPULATION WITH OTHER COUNTRIES.

	INCOME.			EXPENDITURE.		
	£	s.	d.	£	s.	d.
Australia	8	3	0	8	13	8
United Kingdom	2	7	7	3	1	9
Continent of Europe.....	1	11	8	1	8	0
United States.....	1	6	10	0	17	5

Their National Debt is about £136,000,000, 76 per cent yielding direct revenue, 8 per cent works of a permanent character, miscellaneous 14 per cent, the railways alone absorbing £100,000,000, they being almost entirely national property.

COMPARISON OF THE SIZE OF THE COLONY WITH THE FOLLOWING.

	sq. miles.		sq. miles.
Australia.....	2,946,628	Continent of Europe...	3,756,002
Australia and New Zealand	3,075,238	U.S. of America	3,027,591
Canada	3,456,383	sq. miles.	

In comparison to its size the population is as follows: About 1 person to the square mile; in the United Kingdom it is 311·9; United States of America, 21·3; Canada, 1·4.

SYNOPSIS AND STATISTICS.

From Returns of 1894.

Colony.	Public Revenue.	Customs.	Imports.	Exports.	Railways.			
					Mile- age.	Income.	Ex- pense.	Cost of Construc- tion.
	£	£	£	£		£	£	£
New South Wales ..	9,306,711	2,265,430	15,801,941	20,577,073	2,616	2,878,904		36,611,366
Victoria	6,716,814	1,876,007	12,470,500	14,226,546	3,972	2,706,159		37,748,263
Queensland	3,358,302	1,106,941	4,577,400	8,795,559	2,379	931,903		16,469,721
South Australia ..	2,406,544	512,808	6,226,090	7,301,774	1,664	999,997		1,250,000
Western Australia ..	863,680	415,680	2,114,414	1,251,406	1,150	288,251		2,112,318

Colony.	Telegraphs.	Bank Deposits.	Savings Banks.
New South Wales.....	28,686	£29,792,793	£7,217,000
Victoria	7,608	33,308,514	7,165,902
Queensland	9,986	10,646,257	2,095,892
South Australia	5,579	6,802,862	2,408,778
Western Australia	4,463	1,768,562	144,835

	Foreign Imports.	Foreign Exports.
1894	£3,419,576	£3,272,125

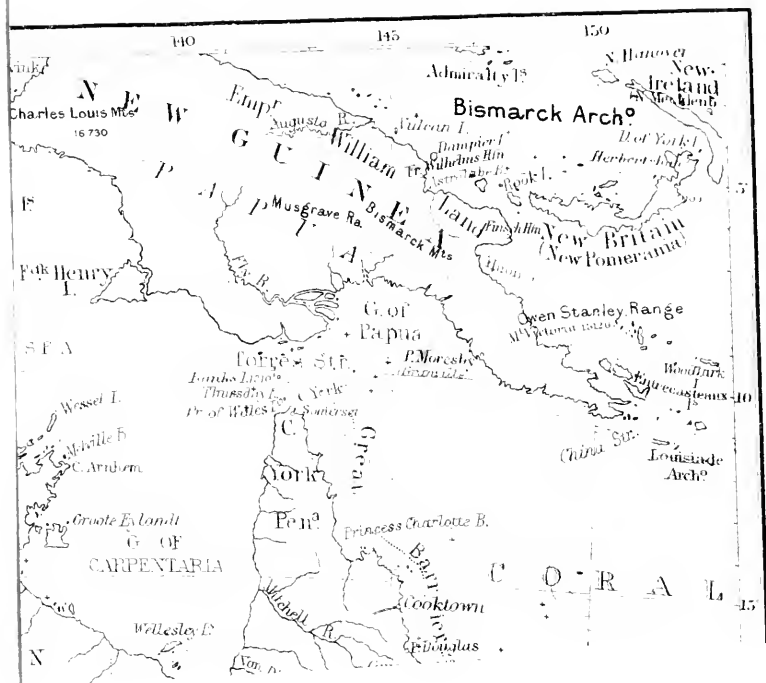
APPENDIX.

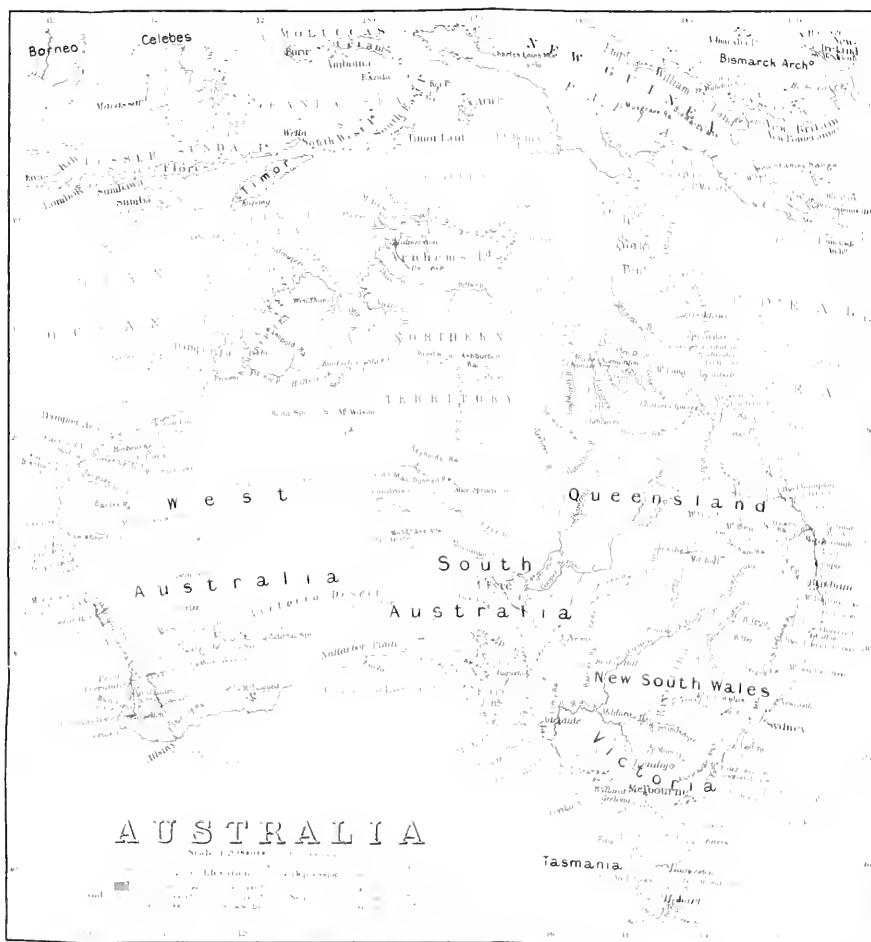
THE TITLE-DEEDS OF MELBOURNE.

THE SITE SOLD FOR TOMAHAWKS, SCISSORS, AND SHIRTS.

The trustees of the British Museum have lately acquired a document which, without doubt, is the veritable title-deed of the land upon which the city of Melbourne now stands. The sum paid for this curious and interesting document was £25. The parchment on which the deed is drawn is long and narrow and in poor condition, the writing in places being indistinct. It relates to the purchase by John Batman, "Founder of Victoria," of land called Dutigalla, and the contract bears the signatures of the three witnesses, James Gumm, Alexander Thomson, and William Todd, in addition to that of John Batman, the purchaser. The latter has signed in the right-hand bottom corner, and his signature corresponds in all respects with his known writing, much of which is extant. Gumm's name is written in the rough hand of a pioneer, but is quite plain; Thomson's is evidently the signature of a less-educated man, and he discards capital letters. Todd's may be said to be the most "clerkly" and the best of the four. The body of the deed is clearly in the handwriting of two persons. This is possibly due to the document being drawn up in the rough, spaces being left for names, the description of the land, and the terms of payment; all of which were inserted afterwards, probably in Hobart (Tasmania), as the parchment bears the name of "Gellibrand, engrosser, Hobart."

Considerable mystery attaches to the history of this document, though its presence in London may be accounted for by the circumstance that it was forwarded here by the Port Phillip Association as evidence of Batman's claim to the land at the time the case was being tested in the courts. On the conclusion of the suit, which was decided against Batman's heirs, the document must have been returned to the lawyers, whence it must have passed into the possession of Sir R. Macdonnell, who was Governor of South Australia in the "fifties." But how it came into his hands cannot be traced. On his death his library was dispersed by Lady Macdonnell, and the deed went the way of such things—to the second-hand booksellers. Here it lay neglected for some years, until its new owner—a gentleman of wide reading—had it called to his mind by a perusal of the history of the Port Phillip settlement. An examination of the parchment revealed its worth, and an intimation of its existence was forwarded to the trustees of the Melbourne Public Library. These gentlemen, however, singular as it may appear, vouchsafed no reply; and the deed was then submitted to the British Museum authorities, who, satisfied of its genuineness and





worth, at once acquired it for the sum named. There has thus passed beyond the possession of Australia a document which in years to come will rank as one of the most valuable of Australian records. Every Victorian will regret the inaction of the Melbourne Free Library officials. The wording of the agreement is so quaint, and the particulars of payment so interesting, that they well deserve a brief summary. The deed commences:—

"Know all persons that we, three brothers, Jagajaga, Jagajaga, Jagajaga, being the principal chiefs, and also Cooloolock, Bangarie, Yanyan, Mowhip, and Mommarmalar, also being the chiefs of a certain tribe called Dutigalla, situate at and near Port Phillip, called by us, the above-mentioned chiefs, Tramoo, being possessed of a tract of land hereinafter mentioned, for and in consideration of 20 pairs of Blankets, 30 Tomahawks, 100 Knives, 50 pairs of Scissors, 30 Looking Glasses, 200 Handkerchiefs, and 100 pounds of Flour, and 6 Shirts, delivered to us by John Batman, residing in Van Diemen's Land, do, for ourselves, our heirs and successors, give, grant, and confirm unto the said John Batman, his heirs and assigns, all that tract of country situate and being at Port Phillip, running from the branch of the river at the top of the port, about seven miles from the mouth of the river, 40 miles N.E. and then W. 40 miles across Tramoo Downs or Plains, and from then thence S.S.W. across Mount Vilmarnatar to Geelong Harbour, at the head of the same, and containing about 500,000, more or less, acres; the aforesaid John Batman to deliver unto us a yearly rent or tribute of 100 pairs of Blankets, 100 Knives, 100 Tomahawks, 50 Suits of Clothing, 50 Looking Glasses, 50 pairs of Scissors, and five tons of Flour."

Here follow the marks of the several chiefs. The date is June 6, 1835.

It will be noticed that in stipulating for the tribute which was to be paid yearly, the six shirts develop into fifty suits of clothing and the 100lbs. of flour becomes five tons. On the other hand, a further supply of handkerchiefs is waived. The land set forth in this deed is now worth many millions. Incredible as it may seem, some of it, during the fabulous prices of the land boom, fetched from £400,000 to £500,000 an acre. Only recently some land in Melbourne—mentioned in the deed—realised a value at the rate of £2,000 per square foot.—*St. James's Gazette*.

British Association for the Advancement of Science.—Toronto Meeting, 1897. Preliminary Programme, with maps and illustrations. Toronto: 1896. This pamphlet of 70 pages, with its maps and illustrations, is a very seductive invitation to members of the Association, inducing them to visit Toronto in 1897. The meeting will, we hope, be a very successful one, and if the programme is duly fulfilled it will be at a cost of from £60 (estimated) to about £100.

METEOROLOGY OF QUEENSLAND.*

(*See Map of Australia and Map of Queensland, p. 82.*)

By MR. CLEMENT L. WRAGGE, F.R.G.S., F.R.Met.Soc., Government Meteorologist of Queensland, and Director of the Chief Weather Bureau, Brisbane. (Late of Ben Nevis Observatory.)

[Report of Address delivered to the Society at the Library, at 7-30 p.m., December 4th, 1896.]

HE commenced by stating that it is generally conceded by geographers and other scientific men that Australasia, that Greater Britain, of which every true Briton is so proud, offers a most fertile field for research in every branch of scientific investigation, such being particularly the case with the science of Meteorology. The lecturer fully recognised this fact when in 1883 he set out on his third voyage to Australia, having previously reorganised experimental work at the Ben Nevis Observatory, and completed the climatological investigations in which he had been engaged in the Churnet Valley and on the Wever Hills, near his old home at Oakamoor, North Staffordshire, and having moreover arranged and classified the museum, which he had the pleasure to present to the town and county of Stafford.

He arrived at Adelaide, having taken observations during the voyage, at the end of 1883, and immediately found that South Australia offered a perfectly fertile field for meteorological research, more particularly in connection with the very rapid changes which obtain there during the summer months as between the exceedingly hot and dry north-easterly winds and the cold "Southerly busters" which follow. He was determined to investigate the conditions attaching to these disturbances, especially at an observatory which he established at Walkerville, on the plains, two miles north-east from Adelaide, and shortly afterwards at another one, established by Gimo, about 2,000 feet high, on the summit of Mount Lofty, about eight miles horizontally from Walkerville; and even at that small height the Ben Nevis results bearing upon vertical barometric gradients were very distinctly confirmed.

In 1885 it was intimated to him that the Meteorological Service of Queensland needed complete reorganisation, and he was commissioned

Honolulu, January 10th, 1897.

My Dear Sir, Herewith please find my lecture fully corrected. Oblige by having the proofs *carefully* examined with the original side by side.

So far, all well. We experienced a blizzard in Nebraska, and a most gorgeous manifestation of the "Angel of Winter" in the Sierra Nevadas, descending from the snow sheets and the snow-laden pine forests quite suddenly to the orange groves of California. And now these lovely seductive tropics again! with the palm trees and all! I declare I am getting quite poetical, so will promptly conclude.

Wishing your Society all success, and with best remembrances to yourself and mutual friends,

Believe me, yours very sincerely,

CLEMENT L. WRAGGE.

ER Sowerbotts, Esq.,

Secretary of the Manchester Geographical Society,
Manchester, England.

by Sir Samuel Griffith, K.C.M.G., the then Prime Minister of the colony, to make a tour of Queensland, including Torres Straits and the Gulf of Carpentaria, for the purpose of visiting such stations as then existed, to examine the instruments, and to report on meteorological matters generally. He found the service in a very crude state indeed, many of the instruments being incorrect, and he reported accordingly.

Returning to Adelaide in 1886, he continued his work there, which was afterwards completed by his wife, and at the end of that year, through the representations of the then Governor, the late Sir Anthony Musgrave, Sir Samuel Griffith, and the Hon. T. Macdonald Paterson, Postmaster General, he was appointed Government Meteorologist of Queensland. Holding this responsible position he immediately recognised the enormous field of work open to him, and that it was his bounden duty to do his very utmost for the Government who had liberally engaged his services. The first thing was to complete the reorganisation of the rainfall observing system, for which purpose telegrams were sent to every reporting station in the colony, instructing the officers in charge to place their gauges at the height recognised by the Royal Meteorological Society—one foot. When the rain gauges had been placed on a scientific basis, he next established a system for exchanging data communication with his colleagues in the other colonies, and by the end of January, 1887, was in a position to prepare isobaric maps of all Australia. In about a month he was thus able to make the first weather forecasts for Queensland, and subsequently proceeded on various trips to different parts of that vast colony, establishing new meteorological stations, a work which has been going on to the present time, so that all Queensland has now a splendid system of Meteorological Observatories of the first, second, and third order, at distances averaging about one hundred miles apart. His next step, having introduced a system of ordinary weather forecasting for Queensland similar to that which obtains at the English Meteorological Office, was to extend the forecasts to every Australasian colony in the inter-colonial interests of his own State, so that by the end of 1887 a chief or general Weather Bureau had been established at Brisbane for all Australasia, and thus forecasts were issued there for all the colonies and surrounding seas, and the extent of accuracy of these warnings and advices now reaches the high figure of 90 per cent.

Whilst on this subject he could not refrain from saying that the Queensland Government has recognised the immense importance of practical Meteorology in a most liberal spirit, especially as bearing upon agricultural, pastoral, and shipping pursuits, and, in accordance with the traditions of Queensland's rapid advancement, has given every assistance possible, so far as ways and means would allow. Thus meteorologists and scientists generally over the entire civilised world have every reason to be thankful to the enterprise of the Queensland Government.

Meteorology has such an immense scope, and embraces such a very wide field, that he could only then give a mere outline of the work which had been, and was being done in that "go-ahead" colony. Astronomy is the most sublime of all the sciences, but Meteorology is of infinitely more practical interest to the squatter, the miner, the farmer, the planter, the sailor, the doctor seeking a suitable climate

for his patient, the traveller, the humble housewife, and, in fact, to every section of the community, in connection with the successful forecasts which can now be made, and in their relation to the trade and commerce of the world.

The lecturer now proceeded to illustrate his remarks by lantern slides, and in showing the first one, an interesting picture of the old windmill in Brisbane built by convicts, he pointed out that the uninitiated believed he had to mount to the top of it, look round with the eye of a seer, put on the mantle of prophecy, and then issue the weather forecasts. His work was thoroughly scientific, and the fore-



The Owens College Meteorological Station in Whitworth Park.

(Mr. Clement Wragge had the pleasure to see this installation.)

casts are the result of delicate observations from all parts of Australia, received at the head office in Brisbane by telegraph. By the aid of his excellent assistants these were plotted on a blank weather map of Australasia, and then the isobaric lines were drawn, upon which the forecasts were based. Thus these forecasts were not made by the ridiculous method of noting whether the needle on a barometer pointed to the words "fair," "change," "rain," etc., and he hoped that our opticians and instrument makers would take a hint and cease to use such absurd words. All barometric indications must be interpreted on

the basis of the meteorologist's creed, which he had had the honour to formulate in the following terms: "I believe in latitude, longitude, altitude, diurnal range, and physiographical features," and this confession of faith is to the true meteorologist every whit as important as is the Apostles' Creed to the theologian, and the creed of "I believe in the log, the lead, the latitude, and the look-out," to the sailor.

If we would do anything towards still further advancing this science of Meteorology we must not only pursue our investigations on the lower levels, or at the bottom of our ocean of air, we must also send our "sounding lead" into the upper regions of the atmosphere, examine the elements there, study the clouds and take their photographs. We must, in fact, establish more mountain observatories, and send our kites and balloons upwards, fitted with delicate self-recording instruments.

The next slide shows the principal, or "first order," stations of Australia, from which observations are received every day at the chief office, and which are so arranged as to connect with each other inter-colonially. "Second order" stations are, in the case of Queensland, between these, and differ from the "first order" in not being supplied with self-recording instruments, and also that the times of observation are not quite so frequent.

The observations at the various stations are taken with the utmost punctuality, and the methods of exposing the instruments are strictly uniform. No branch of science demands thorough uniformity in the management of instruments more than does Meteorology, and it is, amongst other things, particularly essential that this uniformity should be observed in connection with the height from the ground of the thermometers at different places, four feet being the standard height. The subject of climatological investigation is especially of momentous importance to the rapidly extending agricultural interests of Queensland, and if we have not our instruments placed exactly alike we cannot possibly compare the climates at the various places. Therefore the rules of the Royal Meteorological Society are followed exactly, the only difference being that the Stevenson screen is four inches larger than the common pattern of it which is employed in the United Kingdom. This precaution was adopted by the head office at Brisbane in order to provide more ample ventilation for the thermometers, and on account of the very great heat which obtains in Western Queensland.

Mr. Wragge then exhibited the interior of the Stevenson screen, with the dry and wet bulb and maximum and minimum self-registering thermometers. To be on the safe side, and to guard against vitiation of readings by dirt, they insisted in Queensland upon the muslin of the wet bulb being changed once a fortnight—one reason being that they have dust storms occasionally—whereas the rule of the Royal Meteorological Society was once a month.

He then exhibited the instruments which are used for determining the highest temperature in the sun's rays, principally the black bulb thermometer *in vacuo*; but the whole question of measuring solar radiation is at present in a very unsatisfactory condition, and it would be a great thing if a proper and satisfactory instrument could be devised. The one shown is, however, that at present in use, and it is of some service if we can get such instruments to read exactly alike

with the *vacua* in exactly the same state. The lecturer's friend, Mr. Hicks, of Hatton Garden, was making him thirty of them, and is undertaking that the instruments shall be alike in every particular. They are to be specially examined at the Kew Observatory, and then when they are sent out to the different stations he hoped to get some interesting results for comparison. These instruments are placed four feet above the ground.

The terrestrial radiation thermometer was the next instrument shown. It is a very interesting instrument, and of great use in Queensland at the "first order," "second order," and climatological stations. It should be freely exposed to the sky, and the rule in Europe is to place it over short grass, but in Queensland they had either too much grass or none at all, and therefore employed black boards, black being the best radiator of heat. These instruments are of great practical service in agricultural and horticultural interests as determining the line of ground frost, below which it would be unsafe to plant sugarcane, and other tropical plants and fruits.

The new "tropic" rain gauge was then exhibited, which bears the lecturer's own name (being specially devised by him), capable of holding 26 inches without flowing over. The standard height for rain gauges adopted in Great Britain is one foot above ground, but at his suggestion, after consulting with his colleagues in England and Scotland, the height of the gauges in Queensland would be raised to two feet from the first of January next, the chief reason being that during the intense droughts of Western Queensland the ground becomes so hard that when the first thunderstorms occur, accompanied as they frequently are by very heavy rain, there is such a rebound, or splash, from the ground that some of the water may be blown into the gauge, which then registers too much. In Eastern Queensland, too, where the grass grows so long, they found it a very difficult matter to keep it always cut.

The chief Meteorological Observatory at Brisbane and the position of the various instruments was shown.

Here, also, appear those beautiful instruments (first brought out by Negretti and Zambra), the electrically registering thermometers, specially used for securing 3 a.m. readings without disturbing the observer's rest. In fact, the readings remain on the instruments until the observer chooses to read them off.

Richard's automatic instruments for recording temperature, humidity, and atmospheric pressure were also shown.

The lecturer next exhibited types of barometers. Those of the "Fortin," or large standard pattern, are in use at Brisbane, Rockhampton, and Townsville (the three principal coast stations in Queensland), but it was found that the new barometer called the "Kew," having the fixed cistern and the scale contracted to compensate for alterations of level therein, is far better for use in the colonies, as they are more suitable for transit when establishing distant stations in the rough bush districts, and the observer is not troubled with any cistern adjustment.

Referring now more in detail to the forecasting branch of the Weather Service of Queensland, Mr. Wragge remarked that the two great types of disturbance in the atmosphere are the anti-cyclonic and

the cyclonic, and in relation to them the direction of the wind is the reverse, reversed in the Southern to that of the Northern hemisphere. The diagrams of the cyclones and anti-cyclones of the Southern hemisphere were exhibited, and that is a most interesting study. They must bear in mind that such diagrams cannot be produced without observatories, nor, obviously, without the best observers to supply the most accurate data. Having these desiderata, the barometric data from the different stations had first to be reduced to the standard temperature of 32 degrees Fahrenheit, and next to the standard level of the sea. Hence it was necessary that the heights of all the barometers should be ascertained above mean sea level. It was a comparatively easy matter to get the actual levels along the sea coast, and at stations placed on the railway lines; but at many of the far distant inland stations the heights had to be determined by barometric measurement at times when it could be seen that horizontal differences of pressure were but slight, and by this means and by taking means of observations the heights of the far distant stations were obtained within about a foot. The lecturer stated that he received about 500 telegrams every day from all the principal telegraphic reporting stations in Queensland and Australasia generally, giving the conditions of weather, and these being reduced in the office, are plotted on blank diagrams and maps of Australia. Places having equal pressure are then joined by lines called "isobars." The chart he then exhibited gives meteorological conditions which very frequently obtain during the winter, showing well the factors which produce the famous westerly winds of Brisbane and correlative heavy weather over the Tasman Sea, and from his central office special warnings accordingly can be given to the various ports, which are of enormous value to shipping. [Here the lecturer very fully explained the particular chart, the kind of forecasts which could be issued from it, and the reasonings on which they were based.]

A chart showing the conditions which produce trans-continental rainfall in Australia was referred to by Mr. Wragge, and it is one of the most interesting of the series, and the forecasts made from charts of this type prove of the greatest practical value to squatters and people in inland districts. People say, "Oh! Mr. Wragge is a weather prophet," but that, he declared, was pure nonsense, as all the work is done on a scientific basis. He disliked nothing so much as being dubbed "a prophet," claiming to be a meteorological scientist. As soon as he got the slightest indication of certain conditions pointed out on the map, in their connection with V-shaped disturbances, for instance, he knew what was going to happen: but the season of the year, the geographical position of the observer, the physiographical features, and ranges of mountains, have all to be taken into consideration in deciding which winds will bring rain, or the reverse.

By means of another chart the conditions producing hot winds and the sudden changes to cold southerly "busters" on the south coast of Australia were shown. The chart indicates the conditions in the summer time, and the isobars show a great Antarctic depression, like a gully or valley. There is sure to be a tremendous indraught of the hot air from the internal plains of Australia. Adelaide, for instance, will experience temperatures from 100 degrees to 115 degrees in the

shade under such conditions, to be followed quickly by a fall to 70, and perhaps to 65 degrees; dust storms then come up, and perhaps electric disturbances, followed by the sudden reduction of temperature and the Antarctic rain, and frequently south-south-westerly gales and high seas. At the office they would know perfectly well what was coming on, and could advise Adelaide two or more days in advance of the conditions that would be experienced. In England the weather cannot be forecast with any degree of certainty for longer, at the utmost, than two days ahead, and in the United States it is also a difficult matter to issue long forecasts; but in Australia, Tasmania, and New Zealand they were peculiarly favoured, owing to their latitude. It was surprising the extraordinary regularity with which the Antarctic V disturbances followed each other, and he could not but believe that they formed extensions from that remarkable low-pressure belt observed by Ross during his Antarctic expedition. The lecturer maintained most strongly that no branch of science would benefit more from an Antarctic expedition than Meteorology. At Brisbane they had warned New Zealand ten days and even a fortnight ahead of coming storms, a feat which could not be done in the northern hemisphere. The forecasts issued at the Chief Weather Bureau, Brisbane, were, he affirmed, verified to an extent of 90 degrees, and at times even a higher percentage is obtained, and they could advise Tasmania, for example, when and where any particular disturbance likely to affect that island would come off, and of its position at the time the warning was issued, even if over 2,000 miles away.

It had been suggested that he should devote his energies to forecasting the *seasons* of Australia, say from three to four months ahead, but he respectfully declined. He considered it would be most suicidal to true scientific investigation and research, and especially to the interests alike of the Chief Weather Bureau, agriculturists, and squatters, to issue such forecasts, which very probably would fail. It had been done with a fair amount of success in India, but the conditions were quite different. Australia, though a continent, was yet an "island-continent," and there were Antarctic influences in high southern latitudes, bearing on the character of the coming seasons, of which next to nothing was at present known, and which could only be elucidated by Antarctic research. It would be most mischievous and most unscientific to issue a six months' forecast without ample data, and such an attempt would doubtless result in harm to the enormous pastoral and agricultural interests of Australia.

The lecturer then exhibited another most interesting chart, showing the conditions producing those heavy floods for which Brisbane, unfortunately, is famous during the early months of the year. The tropical storms and hurricanes evolve in the neighbourhood of the New Hebrides, and, laden with tropical vapours, encounter an anti-cyclone, or high pressure, system over the northern portion of the Tasman Sea, which they cannot pass. Therefore, by an effect of impact, there is a steepening of the barometric gradients, the anti-cyclonic "sierra" acts as a condenser, and we get heavy south-easterly gales, and rapid condensation of the vapour, causing the heavy rains, especially on the coast ranges, and floods. They could forecast these storms easily, and no tropical disturbance now could possibly approach the Queensland coast

without warning being given. In this connection the lecturer referred to the immense benefit accruing to the Chief Weather Bureau at Brisbane by the establishment of cable communication with New Caledonia. He had established for the Queensland Government two meteorological stations in that island, and had also founded an international meteorological service between Australia and the French dependency. Twice each day his office received weather reports from the stations at Noumea and Gomen, in New Caledonia, and in return for the data so generously supplied by his French colleagues, forecasts for that island were issued regularly at his office in Brisbane and cabled over. He was glad to add that they had been most successful. He had also adopted an entirely new system of giving each storm a specific name, so that those who might experience the effect of any given storm would be able to associate such with its name. He had already drawn upon the Greek, Hebrew, and other alphabets for names, and the system while being novel had also proved most successful. The hurricane warnings are of great service to shipping, and storm signals are in use at the principal lighthouses.

The last chart exhibited showed the conditions producing the heavy weather over the Gulf of Carpentaria, which caused the wreck of the s.s. "Kanahooka." It was a very well-marked monsoonal disturbance, and they were enabled some days before the wreck to advise that there would be this very rough weather and gales. He would like in this connection to mention that it would be of the greatest service to Australia if a cable were laid between Thursday Island and New Guinea, and it would be of immense benefit if they had also telegraph information from the Solomon Islands.

He would like to mention certain new lines of work upon which they were setting out. It occurred to him that a counterpart of the Ben Nevis Observatory, if such could be established in the southern hemisphere, would be of the greatest importance in investigating the conditions attaching to the V-shaped disturbances, and he at once saw that Hobart offered the very position in connection with Mount Wellington. Mount Wellington, in Tasmania, is about 4,120 feet in height, whereas Ben Nevis is 4,406 feet. It rises as directly from the sea as does Ben Nevis, and it lies directly in the track of those Antarctic V-shaped disturbances as does Ben Nevis in the track of many of the North Atlantic storms, and the only difference between the positions of the two mountains is that of a very few degrees of latitude. He brought the matter under the notice of the Royal Society of Tasmania, who brought it under the notice of the Government, and they were kind enough to request the Queensland Government to grant his services to Tasmania for a short period. He went there, and within three days the station on Mount Wellington was started, and afterwards the entire meteorological service of Tasmania was reorganised, but he regretted to say that the officials in Tasmania had not given them the necessary funds to enable them to keep the new stations going. This was very much to be deplored, and he felt quite certain that if the Tasmanian Government really knew the importance of their meteorological stations—and especially of the one on Mount Wellington—to the Meteorology and forecasting problems of the southern hemisphere generally, particularly in connection with

any projected Antarctic expedition, they would hesitate no longer, but would provide the means necessary for the prosecution of such important work. They were doing all they possibly could in the meantime to keep the Tasmanian service afloat; and it might be mentioned that Lord Kelvin, writing to the lecturer, considered that the establishment of a permanent observatory at Mount Wellington, the maintenance of the Tasmanian Meteorological Service, the establishment of high level stations on Mount Kosciuszko, in the Australian Alps, and on the Southern Alps of New Zealand, and the extension of the Queensland Meteorological Service to the South Sea Islands, so as to connect as far as possible the Australasian with the South American meteorological systems, as suggested by Mr. Wragge, "would be very valuable for the Meteorology of the southern hemisphere and for meteorological science generally, especially the proposal of a permanent station on the summit of Mount Wellington, in Tasmania, to continue the work commenced there."

Mr. Wragge did not conclude without special reference to the extended weather chart which he issues periodically, embracing the entire region between the parallels of 40 deg. N. and 55 deg. S. and the meridians of 30 deg. E., thence easterly to 130 deg. W. This chart is prepared (a) with a view to studying the "seasonal," or "long range," forecasting problem over a wide area of the earth's surface; and (b) in the interests of shipping, thus helping masters to choose the most favourable courses at the different seasons of the year—as in "running the casting down," to quote one instance. The directors of the observatories in the foreign countries included in the vast area indicated kindly supply data; and almost every sea captain visiting Australia furnishes the necessary meteorological "readings" for the Red Sea, Indian, Pacific, and Southern Oceans. The lecturer availed himself of the opportunity of acknowledging his indebtedness to these gentlemen, and of having the privilege to publicly tender to them in the new seaport of Manchester his most sincere thanks. Coupled therewith Mr. Wragge also cordially acknowledged the services rendered to him by masters of vessels and their officers in the matter of investigating by "current bottles" the currents of the oceans. The Queensland Government, through the Chief Weather Bureau, supplied blank current-papers in eight different languages to shipping all over the world, and the results had proved most valuable, curious, and interesting, many of the bottles in which they were contained having been carried many thousands of miles.

"PROVINCE OF TUCUMÁN." República Argentina. Sinopsis Estadística de la Provincia de Tucumán. Par P. RODRIGUES MARQUINA, Director de la Oficina de Estadística. Agosto de 1896. Tucumán. Buenos Aires: Jacob Peuser.

THIS little manual is of very great value for the information given, in a condensed form (in 94 pp.), of the natural productions, industries, and value of labour of various kinds in the Province of Tucumán. The information, collected by the State Statistical Department, and edited by the Director, may therefore be relied upon as substantially accurate.

THE SUEZ CANAL.—(*See Map.*)

By ALDERMAN ISAAC BOWES, Salford.

[Addressed to the Members of the Society, in the Library, January 7th, 1895.]

PRELIMINARY REMARKS.

THE name of Monsieur de Lesseps will for ever be linked with this great undertaking, and a brief sketch of his career may be interesting. Thomas Carlyle says: "The history of what man has accomplished in this world is at the bottom the history of the great men who have worked here; whatsoever the general mass of men contrived to do, the things we see standing accomplished are the realisation and embodiment of thoughts that dwelt in the great men sent into the world."

In spite of this powerful claim for honour and respect for our great men, I think Carlyle would not have ranked M. de Lesseps as one of the world's heroes; he would, no doubt, have given him credit for what he called "a huge beaver intellect," the same as our Watts, Arkwrights, and Stephensons, and would have classed him amongst his captains of industry. Such undoubtedly he was, and, after all, the world is more indebted for our progress in civilisation to the captains of industry than to some of the heroes Carlyle delighted to worship.

Monsieur Ferdinand de Lesseps was born at Versailles in 1805. He received a good education and a special training for a diplomatic career. His father represented France in Egypt in the early years of Bonaparte's Consulship. At the age of 23 he was appointed Attaché to the French Consulate at Lisbon. From 1831 to 1838 he was Consular Agent in Egypt, when he first became acquainted with Said Pasha, afterwards the Viceroy of Egypt, and in 1849 he was sent on an important political mission to Italy.

A change of government in France, with a change of foreign policy, led him to resign his diplomatic appointment and give up politics. He retired to a farm at Le Berri, and for five years studied the various aspects of trade between the West and the East. Having been in Egypt, he, like many before him, thought that the narrow strip of the Isthmus of Suez should not for ever remain an insurmountable barrier between the Mediterranean and the Red Sea.

Whilst in Egypt he had been well received by Mehemet Ali, that daring, unscrupulous military adventurer, who from the

position of a humble tobaccoist raised himself to the most powerful position in Egypt, and who, but for the intervention of the European powers, would have overturned the Turkish

Government. A strong personal friendship grew up between Mohammed Said, the son of Mehemet Ali, and M. de Lesseps, who, in his lecture at Paris soon after the opening of the Canal, remarks: "One day while on the roof of a house I was building, and in the midst of scaffolding and carpenters, I received a newspaper which announced the death of the Pasha and the accession of Mohammed Said."

Relying on his friendship with Said Pasha, he proceeded to Egypt to congratulate him on his accession to power, and also to lay before him the great scheme which for years he had been studying and brooding over. His old friend, the Pasha, gave him a most favourable reception, and discussed the project with some of his most intimate councillors and generals, and the result was the promise of a concession to make the Canal, which promise was eventually carried out by a legally executed deed on the 30th of November, 1854.

The Viceroy appointed three French engineers in his service to assist M. de Lesseps in the survey of the route across the Desert for a canal without locks direct from sea to sea. The report of these engineers satisfied Said Pasha of the feasibility of the scheme. Afterwards an International Commission was appointed to examine the route

and report: and their report was favourable on every point submitted for their consideration. Armed with this report, he had now to combat the political opposition of Lord



Palmerston and the English Ambassador at Constantinople, who, from mistaken motives, used every means to prevent the project from being carried out.

In Parliament, in 1857, Lord Palmerston said: "I can only express my surprise that M. F. de Lesseps should have reckoned so much on the credulity of English capitalists as to think that by his progress through the different commercial towns in this country he should succeed in obtaining English money for the promotion of a scheme, which is, in every way, so adverse and hostile to British interests." And, in another speech, he is reported to have said: "I therefore think I am not much out of the way in stating this to be one of the bubble schemes which are often set on foot to induce English capitalists to embark their money upon enterprises which, in the end, will only leave them poorer, whoever else they may make richer."

At length the firman from the Sultan was obtained and the concession confirmed, and now the financial part of the scheme had to be faced. In England he got but little support in this direction, and the capital was chiefly raised in France; and, but for the perseverance, wonderful energy, and diplomatic skill of M. de Lesseps, this important concession would never have been gained nor the capital for this great undertaking raised. It is creditable to the French nation that a large portion of the capital came from the careful savings of the thrifty French people, and that the work was carried out chiefly by French engineers.

Some years were spent in preliminary surveys, in the preparation of machinery, arrangements for labour, etc., and at last an actual commencement was made with the work in 1860; and after years of anxious toil and unremitting attention to the great undertaking, Monsieur de Lesseps was able to say with confidence that the Canal would be open to the mercantile fleets of the world on the 17th of November, 1869.

M. de Lesseps was twice married, and by his first wife he had five sons. His second wife was a Creole. He married her a few days after the opening of the Canal, and by her he had six sons and six daughters, and for some years it was one of the sights of Paris to see M. de Lesseps and his family (called the Canal Fleet), in carriages and on their ponies, riding through the parks. It is said that his father was cousin to the Empress Eugénie, and certainly both the Emperor Napoleon III. and the Empress always looked favourably on his scheme, and the Empress was present in her yacht at the opening of the Canal. After that event, the Emperor granted him the Grand Cross of the Legion of Honour, Queen Victoria created him Knight Commander of the Star of India, and honours were showered upon him from all sides.

But his active, restless mind could not rest content with the success he had won, and ten years after his great feat at Suez he attempted to carry out the stupendous task of cutting across the Isthmus of Panama. This fatal step was the beginning of all the troubles that overshadowed his declining years.

And some of the very qualities which brought him success in the case of the Suez Canal—his perseverance, confidence, and determination—brought him ruin in the Panama scheme. for they enabled him to get his company formed, which swallowed up millions of the savings of the French people. The first sod was cut on the Pacific slope, on New Year's Day, 1880, by his child, Mdle. de Lesseps, with all the display so congenial to his nature.

The history of that stupendous undertaking is a melancholy one; the engineering difficulties had been superficially considered and the financial cost hopelessly underestimated. The frauds to bolster up the company, and put money in the pockets of unscrupulous politicians, financiers, and contractors, were brought to light in the law courts of France, and in his 88th year, the man who had been idolised by his countrymen, was, with his son and others of his colleagues, sentenced to terms of imprisonment varying from two to five years, and to heavy fines. Previously to this, his connection with the company had ceased. The strain on his mental faculties had been too great, and it is said that he was never aware of the sentence passed upon him, and after some months of illness, the Napoleon of canal makers passed away on December 6th, 1894, in the 90th year of his age.

The Suez Canal Company showed some gratitude to the fallen hero, for in May, 1894, they voted 120,000 francs (£4,800) annually to the Countess de Lesseps and his thirteen children.

THE SUEZ CANAL.

The Isthmus of Suez is a narrow neck of land, about 72 miles across, connecting Africa with Asia, and separating the Mediterranean and Red Seas; it is chiefly low, sandy, desert land, without the least sign of vegetation, and entirely destitute of drinking water. There were several dried up lakes, the bottom of some of which were 30 feet below the level of the sea, and as the water from the Red Sea was let into them by making the Canal, they now form immense lakes, through which the Canal passes. The ruins of many ancient cities are found on the Isthmus, and Port Said, at the entrance to the Canal, was founded near the site of ancient Pelusium, which formed a bulwark against invaders at a time when Egypt was the admiration and envy of surrounding nations. Formerly

there was a canal in the Isthmus and some traces of it are still to be found. It was commenced by one of the Pharaohs and finished by Darius; it did not, however, connect the two seas, but only the Red Sea and the Nile. It is recorded that this canal was blocked up by sand in the year 767, and has remained in that condition ever since, and had not M. de Lesseps been endowed with indomitable courage, the sight of this ancient waterway and the knowledge of its fate would have caused him to hesitate in his hazardous undertaking, but it remained for the intrepid Frenchman, 1,100 years after the closing of this ancient canal, to cut a navigable passage across the sandy desert, and through the black and dismal swamps of the Isthmus, to connect the two seas.

Ancient records speak of even earlier attempts to cut a navigable passage through the sandy desert, but they are not very well authenticated. In modern times it is said that Louis XIV., Sultan Mustafa, the contemporary and admirer of Frederick the Great, and Napoleon himself—all three in turn looked longingly at that narrow strip of sand and marsh, and dreamed of doing again what the Egyptian, the Persian, the Roman and the Saracen had done before them. But nothing came of their dreams save surveys and estimates. Then came the financial magician, whose persuasive eloquence gained from Said Pasha, the Viceroy of Egypt (after whom Port Said is named), the important concession, and who accomplished the work which has made his name immortal. These are some of the memories which people the Suez Canal, and the grey-brown wilderness through which it runs. From first to last that long narrow ditch has been the grave of not less than a million men, while the amount of treasure that has been sunk in it is simply incalculable.

Perhaps the idea, at one time prevalent even in scientific minds, that there was a difference between the levels of the Red Sea and the Mediterranean prevented attempts being made to pierce the isthmus, and such a firm hold had this idea on some minds, that an enterprising Frenchman, about the year 1800, proposed to cut a small channel from one sea to the other, and allow the current to wash this channel large enough for vessels to pass through.

At length, in 1847, this problem was set at rest. A joint commission of engineers and scientists was appointed by France, England and Austria. and the result of their labours was the complete upsetting of the theory of the French savant, and the establishment of the fact that the two seas have exactly the same level. Mr. R. Stephenson, the English Commissioner, came to the conclusion that it was not practicable to make a ship canal across the isthmus; or that, if made, it could not be kept open without enormous expense, and, with a kind of left-

handed compliment to M. de Lesseps, said the public might rely on his perseverance, as he would never abandon the work until every shilling of the shareholders' money was expended.

This point as to the levels being settled, and M. de Lesseps having obtained his concession, the next step was to survey the route for the Canal, and again the Viceroy came to his assistance, and appointed three French engineers in his service to assist in the survey of the route across the desert for a canal without locks direct from sea to sea.

This was a long and dangerous business. For four persons sixty camels were required, twenty-five of them loaded with water and victuals, sheep, fowls, etc., for the engineers and fellahs had to be provided for a two months' exploration of the sandy, barren desert. And, as M. de Lesseps said in his lecture, "beyond these animals there was not even a fly in this hideous desert. Their sheep and fowls were let loose to wander at their own sweet will, but never left the precincts of the camp, and the hens pecking about when the camp was struck would jump into their cages on the backs of the camels, afraid of being left behind."

After this preliminary survey, which convinced M. de Lesseps and his colleagues of the practicability of the project, long and tedious negotiations with the ambassadors of continental nations followed; attacks of opponents had to be met, and the fallacy of rival schemes exposed. At length, an international commission was formed to examine and report on the practicability of carrying out the scheme. On this commission England, France, Germany, Austria, Spain and Italy were represented, and the gist of their report was that a direct canal could be made, that its success would be certain, and the results to the commerce of the world would be immense.

Armed with this report and backed up by his own indomitable energy and perseverance, M. de Lesseps got his International Company formed and his capital subscribed. The amount he asked for to complete the work was £8,000,000, but, like many other large undertakings we have heard of, the estimated cost had to be more than doubled before the work was completed.

The actual working survey had now to be made, and soundings and borings every 150 to 200 metres taken, and when you consider that this part of the work had to be carried out in a barren, burning desert, the victuals, and above all the water, having to be taken in some cases over 50 miles by camels, you may well imagine the difficulties the engineers thus early had to contend with.

A commencement in the actual excavation of the Canal was made at Port Said in 1859; a great portion of the labour at first employed was Fellaheen or slave labour, for the Viceroy had agreed to furnish 20,000 labourers and give grants of land to the

company. After some years, these and other conditions were broken through, and the Sultan, in 1859, at the instigation it is said of Great Britain, sent a high functionary to Egypt with a letter to the effect that if the alterations in the concession were not agreed to within six months, force would be employed to stop all further proceedings with the Canal. This dispute was referred to the Emperor Napoleon, who awarded to the company £3,800,000 compensation. The award was of immense service to the company as it enabled them to provide special appliances for excavating the Canal. At one time 60 dredgers were at work, each lifting 2,000 to 3,000 cubic metres per day; long shoots conveyed the sand to the banks; about 66 miles had been excavated by spade work and carried in baskets on the heads of the natives. To supply this army of labourers with water, a freshwater canal was made from the Nile at Cairo to Lake Timsah, and thence along the canal to Suez.

Port Said has well been called the Gateway of the East; it stands on a little strip of land which separates the Mediterranean from the Lake of Menzaleh, into which flows the Pelusian arm of the Nile. It is said to be as unique, geographically and ethnographically speaking, as it is in the number of diversified forms of wickedness which may be found within its borders. On one side of it are the cheap, temporary-looking brick and iron buildings—the half-French half-English shops—and so much of the hurry and bustle of Western business-life as can survive under that fierce Egyptian sun; on the other, the shabbiness, the squalor, and the indolent repose of the Orient.

The mixture of races to be found in the streets of the town is simply bewildering to strange eyes. Half-a-dozen strides take you past as many different nationalities—types of face and build and varieties of costume from the half-naked Nubian in his leopard skin, with his woolly head bare to the sun, to the sallow Turk in his flowing robes—from the Arab sheik in his picturesque, if not over clean, turban and burnouse, to Tommy Atkins in his pith helmet and brown holland regimentals. This is what might be expected at the entrance to the great highway between 300 millions of Europeans and 700 millions of Asiatics.

The total length of the Canal, from the lighthouse at Port Said to the Red Sea at Suez, is 101 miles; about one quarter of the length is through Lake Timsah and the Bitter Lakes; the width of the Canal at the surface through the greater part of its length was 325ft., with a depth of 26ft. in the centre, and large enough for vessels 500ft. to 600ft. long and 50ft. beam; the width and depth have been increased during the last few years, and this work of enlargement is still going on. At the entrance to the Canal at Port Said two breakwaters are carried out about a mile and a half seawards, enclosing some hundreds

of acres as a harbour. The expense and difficulty of procuring stone to build the breakwaters was overcome by making blocks of concrete, 20 to 30 tons each, from sand and hydraulic lime.

The difficulties in feeding and in providing what is as necessary as food, good water, in such a hot, dry climate, for an army of 25,000 workers were very great, but the energy and skill of M. de Lesseps and his assistants were able to surmount them. The Canal is chiefly cut through sand, but rock was met with in one or two places, and great consternation was caused a few days before the opening of the Canal, when the fleets from all nations were gathering at Port Said ready for the inaugural ceremony, by the discovery of some unexpected rock in a part of the Canal they were just finishing. The rock was breaking the buckets of their dredgers.

The engineers came to M. de Lesseps to know what was to be done. He hastened to the place; every one was in despair when, in his determined impetuous manner, he said: "Off to Cairo. Get powder, get it in masses, and if we cannot blow up the rock, we will blow up ourselves."

The deepest cutting on the Canal was 85 feet from the top of the highest ridge to the bottom of the Canal, but for a large portion of the length only the required depth of 26 feet from the surface had to be excavated. The total amount of the excavating was about 98 million cubic yards.

The outlet into the Red Sea at Suez is protected by an embankment on one side, and by a mole 2,900 feet long on the other side. There are passing bays in the Canal every three or four miles to enable vessels to pass each other, but by multiplying these and widening the Canal, vessels can now pass through in about 20 hours, and the capacity of the Canal has been improved by the electric light on the banks and on the vessels themselves enabling them to traverse the Canal by night as well as by day.

There is very little current, and what there is, is chiefly caused by the difference in the tides. From Suez to the Great Bitter Lakes, there is a regular flow of seven hours, the ebb running out in five hours, whilst from Lake Timsah there is a very slow current towards the Mediterranean at the rate of half-a-mile to one mile per hour.

Monsieur de Lesseps had promised that the canal should be opened on the 17th November, 1869; all the Sovereigns of Europe were invited to the opening, and vessels of all nations were requested to put in an appearance on the evening of the 16th.

The opening passed off most successfully; 136 ships, steamers and yachts took part in it, and one of the most important means of communication between the nations of the world was thus brought into existence.

The saving in distance between England and India by this route, in comparison with the route by the Cape of Good Hope, is as follows:—

	Via the Cape. Miles.	By Canal. Miles.	Saving. Miles.
From the Land's End to Bombay.....	11,500 ...	6,300 ...	5,200
" " Kurrachee...	11,200 ...	6,100 ...	5,100
" " Calcutta ...	13,000 ...	8,000 ...	5,000
" " Singapore...	13,000 ...	8,200 ...	4,800

And so great has been the saving in point of time that it has been found possible to send a cargo of cotton from Bombay, land it at Liverpool, send it to Manchester to be manufactured into calico, and in 12 days ship the calico at Liverpool back for Bombay, and deliver it there within 60 days from the time it left India as raw cotton. The Indian mails have also been accelerated in a wonderful degree, for letters, papers, etc., from India are now by Canal and overland mail, *viâ* Brindisi, delivered in England 12 or 13 days after despatch from Bombay.

The following tables exhibit the progress of the Canal from 1870 to 1893:—

Table showing the number of vessels using the Canal, and the gross receipts for each of the years 1870 to 1873:—

Year.	Number of Vessels.	Net Tonnage in Kilogrammes.	Gross Receipts in Francs.
1870	486	436,609,370	4,345,758
1871	765	761,467,050	7,595,385
1872	1,082	1,160,743,542	14,377,092
1873	1,173	1,367,767,820	20,850,726

Table showing progress of Canal from 1870 to 1893 (from "Stanford's Compendium," Africa, Vol. I, p. 570):—

Year.	Vessels.	Tonnage, Tons.	Passengers.	Receipts, £.
1870 ...	486 ...	437,000 ...	27,000 ...	185,000
1876 ...	1,457 ...	2,097,000 ...	72,000 ...	1,129,000
1880 ...	2,026 ...	3,058,000 ...	102,000 ...	1,500,000
1886 ...	3,100 ...	8,883,000 ...	171,000 ...	2,389,000
1889 ..	3,425 ...	9,606,000 ...	180,000 ...	2,735,000
1893 ...	3,341 ...	7,659,000 ...	186,495 ...	2,840,000

For the first three years after the opening of the Canal no dividends were paid, and the payment of interest on capital during construction had to be suspended. The income was insufficient to meet the expenditure, and money had to be borrowed at 8 per cent interest to enable the company to pay its way. In 1874 the payment of interest was resumed, and 25 francs, or £1 per share, on the £20 shares, was paid. This dividend has gradually increased, until, in 1893 (23 years after the

opening of the Canal), 3,341 vessels passed through the Canal with a tonnage of 7,659,059 tons, and receipts of over three million pounds. This enabled the company to pay, in 1893, a dividend of 90 francs 37 centimes per share clear of tax (about 18 per cent) on the £20 shares. The total cost of the Canal was about £20,500,000.*

In 1875, 177,642 shares belonging to the Viceroy were purchased by the British Government for about four million pounds, about £23 10s. 4d. per share (now worth £136 per share). When bought they did not rank for dividend until July, 1895, and the Viceroy agreed to pay 5 per cent interest on them until that time. (These shares were reserved for England on the formation of the Company. The Viceroy took them up.) In 1886 this interest was reduced to 4 per cent.

A plan for deepening and widening the Canal at a cost of £8,000,000 was adopted in 1885 by an International Consultation Committee. A uniform depth has to be given of 8½ metres, and bottom and surface widths of 70 and 82 metres.

A recent writer gives the following account of a passage through the Canal:—"As soon as the steamer left the basin at Port Said she entered the first section of the Canal, which runs in a perfectly straight line for about 30 miles between the brackish waters of Lake Menzaleh on the right hand, and the reclaimed land on the left, a low, level, grey-bound wilderness, behind which you can see the low sand bluffs which mark the outline of what was once the coast of Arabia.

"Long ago, in the days of the canals of Rameses and Pharaoh Necho, the scene was very different to the dismal lifeless prospect that we could see on all sides from the high promenade deck. The wilderness on the left was the land of gardens and vineyards, and on the right stretched one of the most fertile districts in Egypt.

"Below the light, green, shallow waters of the lake lay a sandy, sedgy bottom, which had once been the dry desert, and beneath that again were lying the remains of the buried villages and towns whose inhabitants, ages ago, dwelt in a fair and fertile land, where now there is only a wilderness of sand and weeds and water, possessed by flocks of pelicans and silver herons, and a few herds of half-starved cattle.

"About five hours' steaming brought us to Kantara, and

* The figures in the table are taken from Ald. Bowes' address on "Rails and Railways," published by John Heywood. The following figures, also taken from the same address, may be useful for comparison:—

Year.	Number of Vessels.	Net Tonnage in Kilogrammes.	Gross Receipts in Francs.
1875	1,494	2,002,984,091	22,667,791
1880	2,026	3,057,421,881	36,492,620
1885	3,624	6,335,752,984	60,057,259
1890	3,389	6,890,094,414	65,427,280
1891	4,207	8,698,777,360	81,540,836
1892	3,539	7,712,028,610	74,452,436

here the banks rise to a considerable height, for at this point the Canal pierces a ridge, called in Arabic Kantarat-el-Khazneh, or Bridge of the Treasure, which formed a natural bridge between Africa and Asia, over which passed the caravan route between Cairo and Mecca. Another half-hour took us through the pass and into the Bellah Lake, and here the dreariness of the desert landscape was suddenly transformed and glorified by the splendours of an Egyptian sunset. The moment the sun set there flashed out from the bows of every ship in the Canal the white dazzling rays of an electric search-light. Every ship is compelled to carry one of these between sunset and sunrise, and, as may well be imagined, the effect produced by them is by no means the least beautiful feature of what was now a strange and really beautiful scene.

"For miles ahead and astern we could see the brilliant points of white light constantly appearing and vanishing as the ships carrying them passed between banks of different heights, while our own, sending out its broad fan of rays ahead, made it appear exactly as though we were steaming between an endless succession of morning snow drifts.

"About an hour after nightfall, we stopped for a few minutes off Ismailia to land a few tourists for Cairo, and then entered Lake Timsah, or the Lake of Crocodiles.

"From Tussoum the Canal runs in a straight line through the cutting that takes it through the rocky barrier of the Serapeum, and here the search lights revealed a village pleasantly situated among pretty shady gardens, quite an oasis in the desert, which owes its existence to irrigation from the fresh water canal. A little way to the east lie the ruins of Serapeum, or Temple of Serapis, and near to these, nearly buried in the sand, lie some blocks of limestone, which once formed the pedestal of a monument which Darius the Mede erected on the bank of the vanished canal which once bore his name.

"At the end of the straight stretch the channel of the Canal runs out into the great basin of the Bitter Lakes, which are generally believed to be identical with those Waters of Marah of which 'the children of Israel could not drink, for they were bitter,' when they had come out from the wilderness of Shur and found no water.

"The low, flat banks of the Waters of Marah were almost indistinguishable in the half light from the deck of the ship but the moonlight shone clearly on the rugged slopes and rocky heights of the Geneffeh range to the south-west. I remained on deck, enjoying the strange fascinations of the scene, until we had crossed the Bitter Lakes and entered the last stretch of the Canal, which runs in an almost straight line from here to the head of the Gulf of Suez."

The report of the Suez Canal Company for 1895 states that the transit receipts in that year were 78,426,000fr., or 4,299,000fr. above those of 1894, and surpassed only by those of the exceptional year 1891. The French and Italian expeditions to Madagascar and Abyssinia furnished 2,126,000fr. of this sum. Owing to a reduction in subsidiary receipts and increased expenditure in dredging and on the redemption of bonds, the year's net increase stands at 3,172,000fr. The increased traffic has enabled the directors, while proposing a dividend of 74½fr., or, with interest, 92½fr. net, to assign 3 per cent to the reserve fund, and to increase the annual allotment for renovation. The balance from the last issue of 25,000 obligations will meet the outlay on new works to be continued during 1896. The year's traffic comprised 3,434 ships of 8,448,383 tons, producing a revenue of 75,934,000fr., while the 216,938 passengers produced a revenue of 2,169,000fr., making, with accessory receipts, a total of 78,426,000fr. It was the first transit of 250 of the ships. Three thousand two hundred and sixty-six passed through by night. The average duration of the transits was 16 hours 18 minutes, being a reduction of 23 minutes. Of the ships 2,318 were English, 314 German, 278 French, 192 Dutch, 78 Italian, 72 Austrian, 57 Norwegian, 39 Russian, 36 Turkish, 33 Spanish, 5 American, 3 Portuguese, 2 Chinese, 2 Egyptian, 2 Japanese, 2 Swedish, and 1 Danish. Of the military passengers 47,166 were French, 29,837 English, 14,618 Turkish, 10,675 Italian, 8,860 Russian, 3,194 Dutch, 1,794 Spanish, 1,334 German, 1,096 Portuguese, 35 Austrian, and 26 Chinese. There were 74,878 civilian passengers, and 23,421 pilgrims and emigrants.

NEW BOOK.

"THE GEOLOGY OF ROSSENDALE." By HERBERT BOLTON. Bacup: Tyne and Shepherd. 168pp.

THIS useful little handbook, written by one of our Manchester scientists, will be found of interest to those who are studying this district, made known to us from other points of view by Mr. T. Newbigging, C.E. It is divided into eight chapters—I., Physical geology; II., Surface contour and denudation; III., Faults and faulting; IV., Historical geology; V., The Rossendale lower coal measures and millstone grit rocks; VI., Formation of coal and fossil flora; VII., The fossil fauna of the Rossendale lower coal measures and millstone grit series; VIII., Glacial drift and superficial deposits. The book has about twenty illustrations and a geological map. It would have been more complete with an index, even if we had to spare the list of subscribers. It is a book to be used, and will give clear instruction, especially if used in connection with the fine collection of coal fossils at the Manchester Museum.

THE NICARAGUA CANAL, AS PROPOSED BY THE MARITIME
CANAL COMPANY.

By Alderman ISAAC BOWES, Salford.

[Addressed to the Society in the Library, Wednesday, February 12th, 1896.]

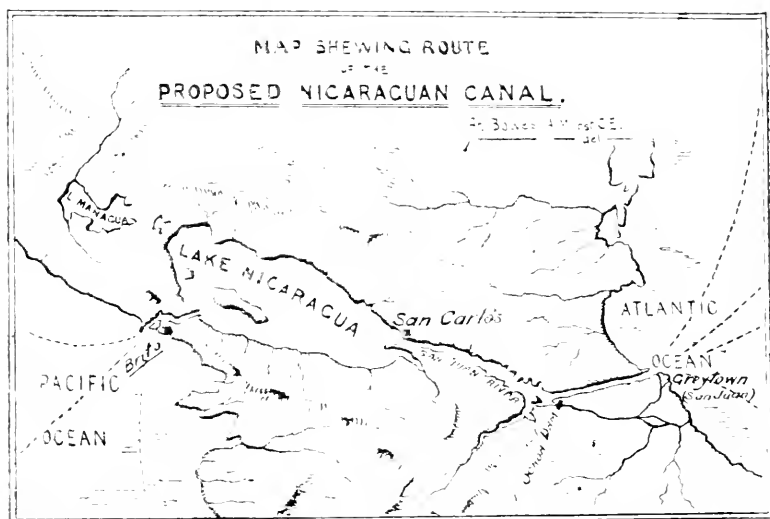
INTRODUCTION.

THE ever-increasing population of this country, the limited area of the land, and the fact that a large portion of our population is engaged in the production of commodities more than we require, but which are suitable for every quarter of the globe, renders it imperatively necessary that new markets should be opened up wherever this can legitimately be done. And it is equally important that the question of communication with these markets, whether by ocean routes, canals, or railways, should be a matter of interest to all concerned in the future welfare of our country. These reasons will, I trust, be sufficient for asking you to consider to-night the project of the Nicaragua Canal, one of the most important engineering undertakings now before the world, and which will, if carried out, form another epoch in the world's commercial history.*

Canals are not by any means a modern invention, for we read that ancient Egypt was intersected with canals, which were used both for navigation and irrigation, and in China they were in use from before the Christian era. The Romans made canals in Italy and the low countries about the mouths of the Rhine, and probably also in Britain, but practically nothing had been done in this country in this direction after the Romans left us until the middle of the eighteenth century, when an Act was passed for making a canal from Sankey Brook, on the Mersey, to St. Helens. Before this was completed the Duke of Bridgewater had commenced his celebrated canal, and the success of that undertaking led to the construction of canals in various parts of England, and it is estimated that over 2,000 miles were constructed in the latter part of the eighteenth and early part of the nineteenth centuries. The introduction and rapid extension of railways put a decided stop to the making of canals, and many people began to think they would be entirely superseded by the swifter mode of transit, but the making of the Suez Canal, about twenty-six years ago, and the splendid success of that undertaking, has given an immense impetus to the making of canals in various parts of the world, and chiefly in the direction of maritime canals. Amongst these may be named the Amsterdam Canal, from the city of Amsterdam to the North Sea, about sixteen miles in length, with a depth of twenty-three feet. This water-

* See Address on the Suez Canal, p. 128.

way has been of great advantage to the trade of that city. The Corinth Canal in Greece, about four miles long, cut through steep rocks over 285 feet high, saves a long and sometimes stormy passage round Cape Matapan. The Baltic and North Sea Canal was opened with great *éclat* by Germany last year. The unfortunate Panama Canal, now at a complete dead-lock, the grave of thousands of poor workmen, and the burial place of millions of the hard-earned savings of the French people; and last, but not by any means the least, our own Manchester Ship Canal, which is so well known to you in all its aspects that I need not occupy your time in describing it. The construction of all these has been stimulated by the success of the Suez Canal. In addition to these may be added the Nicaragua Canal, the subject of my present address, and of which it may safely be said, that, if successfully carried out, it will ultimately rival the Suez Canal in its extraordinary effect on the commerce of the world.



Sketch Map, prepared by Mr. A. Bowes, A.M.Inst.C.E., to illustrate Alderman Bowes' paper.

As you may be aware, the object of this canal is to connect the Atlantic and the Pacific by a waterway across the isthmus of Darien, and before describing the canal it may not be out of place to give a brief description of the country through which it will pass.

Nicaragua is one of the five republics of Central America, the others being Costa Rica, Honduras, Guatemala, and Salvador. The area of these republics is 173,000 square miles and the population about three millions. Since Columbus planted the Spanish standard at the mouth of the Rio Tinto, in 1502, many political changes have occurred in this part of the world. Of these changes I have not time to speak at present. Wars, revolutions, and rebellions have many times devastated the country, until at last it has settled down into the five republics before named, but he would be a rash prophet who would undertake to say

how long these Governments will continue to exist ; in fact, it has been said by residents in these countries that " they sometimes go to bed at night not knowing what sort of Government they will find in existence in the morning." The republic of Nicaragua occupies a superficial area of 433,800 square kilometres, and contains only about 500,000 inhabitants.

It is bounded on the north by the republic of Honduras, on the south by that of Costa Rica, on the east by the Caribbean Sea, and on the west by the Pacific Ocean. It is the most extensive but least populated of the republics of Central America. Along the Pacific the coast is overlooked by the range of the Andes, where two great depressions have formed the lakes of Managua and Nicaragua. On the side of the Caribbean Sea or Atlantic, the coast is low.

English influence preponderates upon all the Atlantic coast, as the English names, which are now more generally used than the ancient Spanish ones to designate the principal ports, prove ; for example, Bluefields for Bahia de Campo Azul, and Greytown for San Juan del Norte.

The mountainous part of Nicaragua is the most healthful and contains the largest population. The most important port on the Pacific coast is Corinto, which offers a good and safe anchorage for large ships. Closed in by the land, the arm of the sea—of which it commands the entrance—is more than seventeen metres deep for several miles of its length.

Its population is 2,500.

Corinto is the principal place for the transshipment of passengers and merchandise from the interior of the country and the borders of the two lakes to and from the Pacific steamers.

The exportation of dyewoods from this port is from 15,000 to 20,000 tons a year. Coffee is exported to Europe, and sugar to the other ports of Central America.

There are at present two direct lines of steamers from Europe to Corinto, the line from Hamburg—Kosmos and Kirsten—which passes through the Magellan Straits, and an English line from Liverpool—that of Lamport and Holt—which is about to undertake this same voyage, the length of which is sixty days. Passengers and merchandise coming from Europe by the numerous lines of steamers which disembark at Colon have to cross the isthmus by the railway at Panama, and are forced to re-embark on the steamships belonging to the Pacific Mail Company. This railway was made in 1855, and cost £1,500,000. Before the railway was constructed goods were taken across on the backs of mules, and passengers by a primitive stage-coach. On account of the unhealthy climate it is said every sleeper laid on the railway cost a life. The railway was made across the narrowest part of the isthmus and is about 47 miles long. The cost of transshipment and the heavy railway dues are almost prohibitive except for light goods and passengers. The mountain ridge or backbone of the isthmus is here 450ft. to 500ft. high, and the attempt to cut through this ridge for the Panama Canal has cost thousands of lives : and millions of pounds have been irretrievably lost in the unfortunate undertaking.

San Juan del Norte (in English, Greytown) is the most important port of Nicaragua on the Caribbean Sea. The population is about

10,000, one-third of which is composed of strangers, negroes from Jamaica, Americans from the North, and English. Although the climate is hot and damp, this region is free from epidemics. The engineers and workmen who are now at work on the construction of the canal all enjoy good health.

The port is improved by the works undertaken by the Nicaragua Canal Construction Company. To avoid the sand banks they are constructing a jetty 1,000 metres long.

Several English lines of steamers trade to San Juan. The port is connected with Lake Nicaragua by the River San Juan, and it is part of this natural waterway which it is proposed to make use of for the formation of the inter-oceanic canal.

San Juan del Norte is a free port, and the line of the zone free to commerce of all nations extends three miles east and three miles west from the centre of the town.

There is here again a proof of English influence in this part of America. It may be noted indeed, that wherever the English establish themselves along the coasts, they make in their colonies, or else insist on other people making free ports, to keep their merchandise in bond without paying customs duties, and to be able at a given moment to easily supply the neighbouring markets.

Bluefields, situated at the end of the lagoon of the same name, is the capital of the Mosquito Reserve, and the second port of Nicaragua upon the Caribbean Sea. The chief articles of exportation are bananas, india-rubber, mahogany, cocoa-nuts, ebony, and cedar. Managua is the capital of Nicaragua and the seat of government. It is situated on the lake of the same name, and contains 27,000 inhabitants. The Americans and the English are likely to take a more and more important position in all the republics of Central America. The Germans establish there every year new and important houses of commerce, but the French and Spanish make very little progress in their commercial business. The Americans, as may naturally be supposed, are most deeply interested in the isthmus, as it has hitherto formed an insurmountable barrier to maritime communication between their Atlantic and Pacific territories. The growing importance of California and other places on the Pacific coast, and the desirability of avoiding the long and dangerous passage round Cape Horn, has of late years, especially since the collapse of the Panama Canal scheme, caused them to investigate and ascertain if it were not possible to hit upon a more practicable scheme than the one propounded by M. de Lesseps for connecting the two oceans at Panama. M. de Lesseps always contended that unless the Atlantic and Pacific can be united by simply piercing the isthmus from sea to sea without locks, as at the Suez Canal, the proposed scheme could not possibly succeed as a commercial enterprise; because of the inadequacy of a canal with locks to pass the traffic that would frequent it, and also of the uncertainty of sufficient water to supply the lockage and evaporation. This latter objection, however, seems to be disproved by the researches of the American engineers who have investigated the subject.

For more than three centuries before M. de Lesseps' time fabulous stories about the wealth of the Indies had been floating in the air, and Columbus had long brooded over the idea of reaching the Indies, *i.e.*,

the East Indies, by a Western route, and at length, in 1492, he prevailed on King Ferdinand, and Queen Isabella, of Spain, to fit out an expedition to explore the unknown regions of the Western Atlantic. Three caravels were impressed into this service by the Crown, and motley crews enlisted from gaols, discharged criminals, forgiven debtors, and the scum of seaport towns. All these were sent to man the vessels. Cape Bojador, on the African coast, was about as far as the navigators of this age had ventured, beyond which the legends told of fiery heat and demons unspeakable to the West, and to the North shoals, ice, and utter darkness.

In his voyage in search of his Eldorado he discovered and formed settlements on many of the West India islands, and on his fourth voyage doubled Cape Gracio de Dios, and sailed along the Mosquito coast in search of the passage to India, of which he had heard. As there was no such passage he, of course, had to return disappointed and disheartened, and he died two years afterwards. In 1513, eleven years after this, de Balboa landed on the isthmus and crossed it in twenty-seven days, and was the first European who saw the Pacific, which he called the Southern Sea, to distinguish it from the Northern Sea, or Atlantic.

Magellan (in 1521), after a stormy passage, doubled Cape Horn, and sailed through the straits now called after him into the more peaceful waters, which he named the Pacific. The gallant Admiral Drake, 50 years after (in 1579), was the first Englishman who ventured on this sea, and his first voyage round the world has lately been described in a masterly manner by the historian Froude in his lectures on English seamen in the 16th century.

It is astonishing that this mighty ocean, covering nearly one-half of the surface of the globe, was entirely unknown to us a little over 350 years ago.

So long ago as 1870, and in the following years, the United States had the isthmus surveyed for the best possible route for a canal by officers of the United States Navy, and the results of these surveys were reported to the Government in 1873.

Of the Darien route at the southern end of the isthmus, it was reported the distance across is about 128 miles, but this includes about 100 miles on the River Atrato, which is navigable for vessels of large size for this distance, but from this point to the Pacific 28 miles of canal would have to be cut. A portion of this would be made through a plain having a rise of about 90 feet, but in the other portion there would be some deep cutting and a tunnel three miles long through a mountain range. This tunnel was proposed to be 112 feet high, with a bottom width of 50 feet, and depth of water 25 feet: twenty locks would also be required. The cost of this route was estimated at twelve millions.

The exploration of the Nicaraguan route gave much more satisfactory results, and it was recommended as the most practicable and convenient site for a canal.

Notwithstanding this report, presented in 1876, no steps were made to construct the canal by way of Nicaragua, and the next scene opens in Paris. In 1879 an International Congress met in Paris, under the presidency of M. de Lesseps, to consider the site of the

inter-oceanic canal, as to the financial success of which no doubt was entertained. The preference of the United States Government for the route through Lake Nicaragua was laid before the Congress; that route was not adopted for one reason, amongst many, which was regarded as decisive. Both for permanency and convenience it was deemed desirable to construct a sea-level canal on the model of that at Suez, and as no route over the isthmus is so short as the line about 50 miles long, drawn north and south from Colon to Panama, therefore, the place of M. de Lesseps' ill-fated project was fixed at Panama. The scheme was attempted to be carried out, with the result with which we are all so well acquainted.

In 1887 a concession was granted to the Nicaragua Canal Company which contained some stringent conditions, and at last an actual commencement was made with the work in 1889.

The scheme now being attempted to be carried out is the one recommended by Captain A. G. Menocal, of the United States Navy.

Commencing at Greytown it passes through an easy level country for about 20 miles to the San Juan river, which is to be dammed up at Ochoa by a dam 1,900 feet long by 70 feet high to form a portion of the canal. From Greytown to Lake Nicaragua the distance is 96 miles; there will be three locks before the lake is reached, of an average lift of 35 feet 4 inches, the surface of the lake being about 110 feet above the sea-level. The route is then, for $56\frac{1}{2}$ miles, through the lake, which is 110 miles long and 40 to 50 miles wide. On the Pacific side of the lake the difficulties are greater, as over 110 feet has to be got down in about 17 miles. Three locks of an average lift of 36 feet 8 inches will be required; it is proposed to make these locks 650 feet long by 80 feet wide. This is a greater lift than in any locks yet constructed, but the American engineers consider themselves equal to the occasion, and, no doubt, given time and money, they will be able to carry out the design. Difficulties similar to those on the Panama Canal will here be met with, but to a much smaller extent; near the Pacific the mountain range will have to be cut through, involving a cutting in some parts of 110 feet deep. The total length of the canal is about 169 miles, but only about 27 miles of this is actual cutting; the remainder is through the rivers and the lake, and as a greater speed can be attained on the lake than on the canal another great advantage is gained by adopting this route.

The canal is to terminate in the harbour of Brito, on the Pacific coast, where a breakwater has to be made to enlarge the harbour. The minimum depth of the canal will be 30 feet, and, except where cut through the rock, wide enough for vessels to pass each other. It is estimated that the cost will be about fifteen millions, and that it can be completed in seven years, and when completed it is said the passage through from sea to sea will be made in twenty-eight hours.

Such a favourable impression had this project upon the United States Government that Congress voted 25,000 dollars to cover the cost of an inquiry into the feasibility of the scheme, and a Commission of Investigation is now engaged in examining the work so far as it has gone, and no doubt the question of the guaranteeing of the bonds of the company by the United States will be influenced by this report. The Construction Company have asked the United States Government

to guarantee bonds for seventy million dollars (about fourteen millions sterling), but for the reasons I have mentioned this concession has not yet been granted.

The saving in distances for steamers by this route will be:—

From New York to	San Francisco,	8,267	miles.
" " " "	Melbourne,	3,000	"
" " " "	Valparaiso,	3,400	"
" " " "	Yokohama,	6,827	"
From Liverpool	San Francisco,	5,800	"
" " " "	Yokohama,	2,600	"
" " " "	Valparaiso,	1,200	"
" " " "	Auckland,	750	"
" " " "	Hong Kong,	1,265	"

The potentialities of general traffic development are not capable of exact calculation, but undoubtedly are great, while what may be termed its local traffic, *i.e.*, communication between the adjacent Atlantic and Pacific States of both North and South America, is justly estimated to promise great results. To a nation like ours, carrying some 75 per cent of the ocean traffic of the world, the execution of this canal—which in one shape or another has been discussed for over three centuries—will be of transcendent importance. To the United States this waterway will mean an immense transformation of markets as well as routes. There is no doubt that Great Britain can, if she chooses, reap great advantages from such a maritime highway, concerning which it has been ably said by an American of high repute that the countries chiefly brought into contact by the Suez Canal are old and densely populated, and have few new or untried resources awaiting development; on the other hand, Western, Northern and Southern America, Australia, Corea, Japan, and Columbia and East Siberia are the abodes of vigorous, rapidly-increasing peoples, possessing vast resources awaiting development. But there is no need to multiply words on the subject, every intelligent man knows that the commerce of the world will gain vastly by the prosecution of this enterprise. In all its aspects there is no work being constructed which promises so much for mankind, and more especially for this little island of ours, with its growing population and its dependence on our maritime communications with all parts of the world, and with 75 per cent of the shipping of the world.

Since this lecture was delivered the United States Commissioners appointed to inspect the work done, and report on the scheme in its engineering and financial aspects, have given a very unfavourable report. They say it is neither practicable nor advisable to attempt to carry out the scheme upon the data at present available, and they recommend a further survey of the route at an estimated cost of £70,000 and of eighteen months in time. Many of the engineering works proposed will have to be reconsidered, more locks introduced, and the provisional estimate of cost as given by the Commissioners is nearly double that of the Canal Company. The general trend of the report is unfavourable to the Canal Company, and is, no doubt, a

serious blow for the project, and much will depend upon the action of the United States Government as to whether the scheme will be carried out on the lines and the route proposed by the Company or otherwise. It is evident the capital to carry out the work will never be raised unless guaranteed by the United States Government.

The *Engineering News* (American) announces that "The United States Senate Committee has decided to allow an expenditure of 150,000 dollars in making further surveys of the route of the Nicaragua Canal. This sum is quite inadequate for a complete and exhaustive survey."—March, 1897.

GEOGRAPHY IN THE EXAMINATIONS OF THE LANCASHIRE COUNTY COUNCIL, 1896.

(Communicated by Mr. E. G. W. HEWLETT, M.A.)

THE Examiner in Commercial Geography, Mr. A. W. Clayden, M.A., Principal of the Cambridge University Extension College, reports as follows on the papers sent in for Commercial Scholarships and Exhibitions:—

Commercial Scholarships.—"The papers sent up were of very good quality, and showed that the candidates had made a serious study of the commercial aspects of the subject. Three candidates were especially good, each obtaining more than two-thirds of the possible number of marks, whilst two others were only just below that standard.

"However, while it seems that detailed attention had been given to the locations of special industries, very little was known of the why and wherefore of that localisation.

"Trade routes were also very imperfectly understood, and the question—'Name the railway lines upon which the following towns are situated,' which gave ten important places in England and Scotland, was most imperfectly and inaccurately answered."

Commercial Exhibitions.—"The answers were, on the whole, of a very fair quality, a large number of the candidates showing a good knowledge of the commercial aspects of the subject.

"There were, however, frequent indications that some of the candidates had been drilled to answer likely questions without having a sufficiently sound general knowledge; thus, in describing a voyage round the Irish Sea, many candidates had exhausted their knowledge when they had described the Lancashire coast. Similarly, home questions were far better answered than more general ones.

"Very few candidates knew much about the languages spoken in different parts of the world, few being apparently aware that English is the language of Australia and of the United States of America.

"A question on the counties and towns of Wales was very seldom attempted, and one on the meaning of latitude and longitude gave rise to a surprising number of mistakes."

Junior Commercial Exhibitions.—"Many of the answers sent in were very good, and a large number were very fair, the indifferent ones being quite in a minority.

"The commercial aspects of the subject had evidently been well taught in the great majority of cases, but there were signs which cannot be mistaken that this has often been done at the expense of the more general instruction, which ought first to be secured. Thus many candidates who would correctly locate certain British industries, or give a fair description of one of our great railway systems, made the most extraordinary mistakes in reply to the question which asked them to name the counties on the east coast of England, and to give the chief towns and ports. Again, of forty attempts to say what the trade winds are, and where they are to be found, only one answer obtained more than half marks, and seventeen were quite worthless."

THE CANALS AND NAVIGABLE RIVERS OF ENGLAND.*

By LIONEL B. WELLS, M.INST.C.E., MANCHESTER.

[Addressed to the Society, in the Library, Monday, February 2nd, 1896.]

IN preparing a paper on "Canals" for the Manchester Geographical Society, I feel that the practical side of the subject should receive attention as well as the historical or *quasi* scientific, for, in my opinion, the question of inland transportation is one of prime importance to this country, especially to the manufacturing and mercantile community, for water carriage may have a considerable influence: in fact, seeing that the recent attempt to obtain lower railway rates at the hands of Parliament has failed, the competition of waterways becomes all the more necessary. The position between ourselves and foreign countries appears to have been reversed during the last half century, and, instead of possessing the cheapest inland transportation, we have now the dearest.

Mr. Mullhall states, in Vol. LXVI. of the *Contemporary Review*, that in 1850 the ordinary cost of land carriage for goods, in Europe, was 8d. per ton per mile, and, quoting from the *Journal des Economistes*, gave the ordinary freight charges per ton per mile on railways as follows:—

	d.		d.		d.
United States...	0.40	Holland	0.78	Belgium	0.80
Germany.....	0.82	France.....	1.10	Russia	1.20
Italy.....	1.25	Great Britain ...	1.40		

The average is 0.97d. per ton per mile.

Assuming the same services to be rendered, this shows that our railway rates are 350 per cent higher than those of the United States, and 75 per cent higher than those of Belgium, with whom we are in active competition. Our railway receipts being amongst the highest and the volume of traffic so much greater than elsewhere, the income ought to be proportionately large. Unfortunately the railways are hampered with large capital accounts, and we cannot calculate on any considerable reduction in the rates of carriage. The companies agree rates, and then struggle for the traffic. Genuine competition is afforded by independent waterways, on which the public can carry their own goods in their own vessels.

By reference to the map of canals in the possession of the Society, it will be seen that from York southwards there is a network of canals and river navigations, in all 3,950 miles. Most

* This is an abstract only of Mr. Wells' very valuable paper.—ED.

of these exist—the majority with little or no improvement in carrying capacity from the time of their construction. A few have been improved, but more have become less efficient, and others derelict.

2,550	miles	are owned by independent companies
1,400	„	are in the hands of railway companies.
140	„	have been converted into railways.
300	„	are derelict or abandoned.

The first Act of Parliament affecting inland navigation refers to the Thames, dated 1423; there is an Act for the Lea in 1425, and for the Yorkshire Ouse in 1462. In the next century we find seven, one of these referring to the Exe 1536. The term “Canal” is first mentioned in 1572 in relation to the navigation made at Exeter. This canal is also noticeable as having been widened and deepened to accommodate sea-going vessels upwards of 60 years ago.

Although some rivers were made navigable, no canal is again mentioned until 1720, when the name of the Leeds and Liverpool Canal appears side by side with that of the Mersey and Irwell and River Weaver Navigations. From 1700 to 1760 29 bills were promoted, three only relating to canals. The Bridgewater Canal was first opened to Manchester in 1762, and through to the Mersey at Runcorn in 1776. Following the success of this, Acts of Parliament were applied for concerning 85 waterways in the last forty years of the eighteenth century, 69 of which were for canals. From 1800 to 1830 only forty applications for new waterways were made, while from 1830 until 1883, when the Manchester Ship Canal Bill was first promoted, the Severn Navigation Act is the only one of importance.

The waterways of England fall geographically into six groups, five connected with estuaries, viz.: The Humber, Mersey, Wash, Thames, and Severn, while the sixth centres round Birmingham.

The canals connected with the Humber are all barge canals, including the Aire and Calder, the most successful of our Inland Navigations. The Humber is connected with the Mersey by means of the Aire and Calder, and Leeds and Liverpool; another route is by the Aire and Calder, Calder and Hebble, Rochdale and Bridgewater Canals; a third route is by way of the Huddersfield, Ashton, Rochdale and Bridgewater Canals. The Ashton and Huddersfield are narrow canals in the hands of the London and North-Western Railway Company, and the Manchester Sheffield and Lincolnshire Company respectively.

Want of system is apparent, the locks being of different sizes, the depth of water varying, and four ownerships occur in a distance of 117 miles.

To the south the Humber is connected with the Thames by way of the Trent and five canals, one of which is narrow.

The Mersey group includes the Great Ship Canal, which, being primarily a route for ocean-going ships, cannot properly be classed as an inland navigation. The St. Helens, Weaver, Trent and Mersey, and Shropshire Union Canals are also in this group. All these except the Weaver are railway owned; the two last, which are narrow canals, form the only communication with Birmingham and the south.

Around Birmingham the canals are all narrow, and are, to a great extent, owned by railway companies. There is, however, an independent route to the Severn, and, although, hitherto there has not been a heavy traffic carried along it, it has been useful in keeping railway rates in check, the rates from Bristol and South Wales being lower in proportion to the distance than the rates from Liverpool, while the Gloucester and Berkeley Canal has materially added to the prosperity of Gloucester and the Midlands.

From the Severn to the Thames the present condition of inland navigation is deplorable. There are two distinct routes, one by the Stroudwater, Thames and Severn, and River Thames, and the other by the River Avon, Kennet and Avon Canal, and the Rivers Kennet and Thames.

From the Thames to the north-west, as well as to the north-east, the practicable route is along the Grand Junction Canal, a barge canal which follows the course of the London and North-Western Railway to Rugby, from whence it communicates with Birmingham after passing along four other canals, all of which are narrow. To the north the company has recently purchased the Grand Union and Leicestershire and Northamptonshire Union Canals, by which means it gains access to Leicester, thence by the Leicester Navigation and Loughboro' Canal to the Trent. The Grand Union is a narrow canal, but there is a prospect of its being made navigable for barges.

The group connected with the Wash are all river navigations, but of late years the navigation has not been considered of great importance, and has had to give way to the interests of drainage; lately, on the Ouse, near Bedford, a considerable outlay has been made with a view to restoring navigation.

Having regard to their dimensions the canals of England and Wales may be divided into five classes:—

1. Narrow boat canals.
2. Shallow barge canals.
3. Improved barge canals, 6½ft. deep and upwards.
4. Ship canals, 13ft. to 18ft. deep.
5. Manchester Ship Canal, 26ft. deep.

1. The dimensions of the locks of the narrow canals vary and provide for boats differing in length from 71ft. to 81ft., with beam varying from 6ft. 4in. to 7ft. 2in. The

depth of water also varies. The cargoes may be reckoned at from 18 to 30 tons.

2. The small barge canal locks accommodate vessels differing still more in dimensions, and the barges carry cargoes varying from 40 to 60 tons.

3. The improved barge canal locks accommodate crafts carrying from 90 to 350 tons. This weight has been taken in one cargo on the Weaver, and the locks will accommodate a train loaded with 1,000 tons and upwards.

4. Ship canals are short and of no importance, except the Gloucester and Berkeley, which has a large traffic.

5. Manchester Ship Canal, which is really an extension of ocean traffic 35½ miles inland.

As seen by the map, the railway-controlled canals are favourably situated for securing traffic, but nevertheless, out of a total tonnage of 34,121,230 tons, returned in 1888, the railway canals are only credited with 6,609,310 tons, less than one-fifth.

There are four ship canals, including the Manchester Ship Canal. The three others are 18ft. deep or less, the total length aggregates 58½ miles.

There are eleven waterways navigable by craft drawing 6ft. 6in. to 9ft. 6in., which have a total length of about 230 miles. The Weaver, Aire, Calder, and the Severn are the most important of these, all of which are independent. The improved sections of these waterways aggregate 107 miles, and the united traffic in 1888 was upwards of 4,000,000 tons, or 36,000 tons a mile. They carry, therefore, between one-eighth and one-ninth the total tonnage carried by all the rest, and approximately five-eighths of the tonnage carried by the railway-controlled waterways. The latter are stated in the return to aggregate 1,024 miles, therefore, on 9½ times the length of waterway they only carry 65 per cent more traffic. The barge canals accommodate craft about 70ft. long and 14ft. beam, carrying 40 to 60 tons; these aggregate 2040 miles, while the narrow canals on which the locks provide for boats of about the same length with 7ft. beam, or less, carrying cargoes from 18 to 30 tons, aggregate 1,240 miles.

The capacity of a narrow canal efficiently worked is shown by the Birmingham and Warwick Junction which is only two-and-a-half-miles long and has a single line of six locks in that short distance. It carries, nevertheless, 195,000 tons per annum.

It is noticeable that with scarcely an exception the sills of canal locks are well below the navigable draught of the waterway, proving clearly that a much better route could be provided, and was intended to be provided, by the founders of the canals.

This is a matter of vital importance, for every additional inch of draught allows for an additional ton of cargo being

carried by narrow canal boats, and as the other expenses, including haulage, are scarcely affected by the weight added, the addition is almost clear gain to the merchant or carrier.

The same horse will haul at an equal speed a narrow boat loaded with 20 tons on a narrow canal, a barge loaded with 40 to 50 tons on a well maintained barge canal, or a vessel loaded with 100 tons on a 10ft. waterway such as is provided on the Weaver.

Two horses haul 200 tons and upwards on this waterway, but the large barges from 200 to 300 tons are, as a rule, propelled by steam or towed by a steamer. On the Continent, canal barges carrying 250 to 300 tons are hauled by two horses.

On the advent of railways the canal companies opposed them, but soon became alarmed at the progress made, and either sold the waterway to a railway or themselves made railways and became in effect railway companies. In 1846, seventeen Acts of Parliament were passed transferring 776 miles of waterway to railways. In France, the Government took advantage of the scare and purchased for the State many of the canals. This policy was pursued until all except seven per cent have been acquired by the State, and made toll free.

We have 43 navigable waterways controlled by 13 different railway companies. The London and North-Western Company controls six canals, 460 miles long; the Great Western Company eleven canals 230 miles long. There are upwards of 130 different lengths of waterway and more than 100 proprietors. It would be to the public advantage that many of these should amalgamate and provide through routes from east to west, and north to south.

The Germans understand the advantage of quoting through rates, and extend them to countries across the sea. It matters not how far from the sea a German factory happens to be, quotations are given from any town in Germany to any part of South Africa.

The *Manchester Guardian* about a year ago gave the following figures which may be taken, I think, as fairly accurate, viz., that the weight of minerals and goods transported annually within the United Kingdom was—

	Tons.
Railways.....	309,596,000
Canals and navigable rivers.....	36,300,000
Total—Internal transport ...	345,896,000
Shipped coastwise.....	25,000,000
Total—Home transportation...	370,896,000

This compares with 84,000,000 tons of cargo moved in ships trading to the Colonies and foreign ports. The coastwise and oversea traffic together reaches 109,000,000 tons, thus we find the weight transported by railway and canals is more than three times the united volume of our boasted sea-going and coasting trade.

Mr. Chauncey Depew estimates the ocean tonnage of the world at 140,000,000 tons, whereas the railway tonnage carried 100 miles he considers equal to 1,400,000,000 tons, or ten times as much.

In 1870 the average cost of railways in the United Kingdom was £34,000 a mile, and this is the lowest amount returned. Since then it has increased year by year, until in 1893 it reached £47,000 per mile; and the contracts for the extension of the Manchester, Sheffield, and Lincolnshire Railway from Nottingham to Quanton Road, to give access to London, show that this will cost at least £65,000 a mile for construction alone.

The cost per mile of making railways throughout the world varies but little from year to year.

In 1840 it averaged.....	£15,800 per mile.
„ 1860 „	£16,300 „
„ 1880 „	£17,200 „
„ 1892 „	£15,500 „

This may be put in the United States at £7,500, allowing 50 per cent for watered capital.

The latest figures are the lowest, whilst in our country it stands at 38 per cent above the lowest, and is continually increasing.

It appears that, whereas formerly we had the advantage of cheaper transport than our competitors, we have now to pay higher rates for the carriage of our internal traffic than any other manufacturing people.

As we have seen, the cheapest railway carriage is provided in the United States of America. There the average rate is 0·40d. per ton per mile, but in the same country the cost of carriage by water is said to be 0·20d., or one-half the cost by railway. The Americans are not content with this, but are annually spending large sums to improve their canals and rivers, and are constructing a canal which will connect the waters of Lake Michigan with the Missouri, and thus allow of the passage of vessels to the great lakes and tributaries (some 15,000 miles in extent), to the Mississippi and its tributaries (16,000 miles in length). They are also spending £1,800,000 in deepening the Erie Canal from 7ft. to 9ft. All these waterways will be toll free, and as the Americans are, I believe, our most formidable trade rivals in the future for the trade of the world, it is necessary for us to see that they do not gain too great an

advantage. They claim that with a population of 65,000,000 the United States produce and consume over one-third of the iron, cotton, and copper, and consume one-fourth of the wool and sugar produced throughout the world.

Their coal output has increased enormously, and bids fair to surpass ours in a year or two.

Canada is also spending largely on her inland waterways, and is deepening the canals in the valley of the St. Lawrence to 14ft., so as to provide this draft from the Great Lakes to the ocean.

Railway rates have been decreasing in the States. In the case of the trunk lines the rate per ton per mile fell from 1·4d. in 1865 to 0·32d. in 1890. In spite of such reductions, the line of navigation through the great lakes has increased to an unparalleled extent, the tonnage passing the St. Mary's Falls Canal having risen from 2,000,000 tons in 1881 to 13,000,000 tons in 1894.

The reduction in railway rates commenced on lines in competition with the waterway; here industries flourished, and rendered low rates beneficial to carrier as well as to producer and consumer.

The impossibility of regulating railway rates by law has lately been shown in America, where the Inter-State Commission has failed. Here we have had little or no reduction during the last 40 years on charges which were first levied when the price of commodities was much higher than it is now, and trade profits on the annual turnover much greater.

The following is an extract from an address by the Instructor in Political and Social Science at Haverford, in the United States:—

The cheapest freight rates by rail to be found in the world are those for grain between Chicago and New York. And why? Because the cheapest inland water transportation rates in the world are those between the same points.

All the railroads of the United States have been steadily lowering freight charges during the past 20 years, and largely, of course, because improvements in track and equipment have made this possible. Those roads, however, that have made the most improvements, and the greatest reduction in rates, are the great trunk lines leading into New York from the West—those that compete with the Great Lakes, the Erie Canal, and the Hudson River. The average freight earnings per ton mile of all the railroads in the United States for the year ending June 30th, 1890, were 0·941 cents. For the year ending June 30th, 1891, they were 0·895 cents. The ton mile earnings of the New York Central and Hudson River Railroad were 0·730 cents, and the Pennsylvania Railroad 0·661 cents; on the Lake Shore and Michigan Southern 0·653 cents; and on the Michigan Central 0·726 cents; whereas, the average earnings per ton mile on the Chicago, Milwaukee, and St. Paul, and on the Chicago and North-Western Roads, coming but slightly into competition with the Great Lakes and other waterways, were 1·06 cents and

1·03 cents respectively. The following table, showing the wheat rates per bushel from Chicago to New York for the years 1868, 1880, and 1891, by water, by water and rail combined, and by rail, indicates very plainly how freight rates have fallen, and how this movement has been led by the waterways:—

	By Lake and Canal. Cents.		By Lake and Rail. Cents.		By Rail. Cents.
1868	22·79	.....	29·00	.....	42·60
1870*.....	17·10	.....	22·00	.....	33·30
1880	12·27	.....	15·70	.....	19·90
1889*.....	6·89	.....	8·70	.....	15·00
1891	5·96	.....	8·53	.....	15·00
1892*.....	5·61				

On Belgian State-owned railways tolls are fixed to cover cost of working and maintenance, and bear interest on capital cost; the lowest remunerative charge is said to be 0·348d. per ton per mile.

In France, under similar conditions, a charge of 0·592d. per ton per mile is made.

Sir G. Findlay, late general manager of the London and North-Western Railway Company, stated the cost of working full train loads of coal and returning empties between Wigan and London was 0·21d. in 1870, and had risen to 0·24d. in 1875.

These figures, with the charge of 0·4d. per ton per mile, quoted as the cost by American railways, appear to give good ground for taking 0·5d. as the lowest possible rate of carriage for general goods traffic by rail in this country. Freight rate for coal on the Taff Vale Railway, in owner's trucks, for full train loads, was given as 0·55d.

A Belgian writer puts the cost by canal, on an annual traffic of 600,000 tons per mile, as 0·284d., made up as follows:—

Tolls :	{	Interest and redemption of capital...	0·112
	{	Repairs and maintenance.....	0·022
Freight :	{	Towing by steam.....	0·047
	{	Boat and boatmen	0·103
Total.....			0·284

This is a trifle above the cost of through coal trains for working only as given by Sir G. Findlay. The rate of freight from Liège to Antwerp is quoted from 1s. 9½d. to 1s. 11d. per ton on a navigation 97 miles long 7ft. deep, less than 0·25d. per ton per mile, and although two lines of railway compete with the traffic it amounts to 570,000 tons per annum by water. 6,000,000 tons are carried into Paris by water annually, this is 41 per cent of the total entering by rail and water. 1,000,000 tons are carried from Rouen in direct competition with the railway. Berlin is supplied to the extent of half its imports by canal.

* The figures for 1870, 1889, 1892, are in addition to those given by Mr. John's ...

Of late years the percentage of goods arrived by water has increased in much greater proportion than by railway in both France and Germany, and the special reports called for by the Foreign Office show that great attention has been paid to the improvement of the waterways in both countries, and that the increase of traffic has been most marked. German iron and hardware is carried by rail from towns distant from 135 miles from Antwerp at half the price charged for similar goods from Wolverhampton to London, although the latter distance is less by five miles.

The capacity of canals for traffic is shown by the Birmingham Canal carrying 7,713,000 tons on 159 miles. The Birmingham and Warwick Junction 194,630 tons on 2 miles 5 furlongs, or 77,900 tons a mile in narrow boats. The Weaver shows 75,000 tons a mile, and the lower portion of the Aire and Calder a still greater ton mileage. Here special arrangement is made for conveying coal in floating tanks.

Canals, with few exceptions, remain as they were before the introduction of the locomotive.

The locomotives first used by railways weighed about four tons, and ran on rails 36lbs. a yard. Now we have locomotives 50 tons weight, and steel rails of 90lbs. a yard. It is only necessary to compare the efforts made to develop railways with the neglect accorded to canals, to see one great reason for the advance of railways and the decay of canals.

The advantage of large canals is shown by what has happened in France. Between 1887 and 1891 the number of barges 126ft. long, suitable for passing the locks of canals of the first class, increased from 933 to 2,016. At the latter period 7,500 barges, capable of carrying 200 tons and upwards, were in use, numbering nearly half of all the craft employed on inland navigation. Lighters have been for some years employed by Messrs. Cory and Sons to convey coal from the colliery stages on the Aire and Calder round the coast to the Thames; each carries 350 tons, and a tug tows several barges.

The amalgamation of canal companies is very necessary. The London and North-Western Railway Company consists of upwards of 48 companies. The two canal companies having the greatest mileage are the Shropshire Union, 200 miles, and the Birmingham, 150 miles, both owned by the London and North-Western Railway Company. Since the purchase of the Grand Union and the Leicestershire and Northamptonshire Union Canals the Grand Junction Canal has increased its mileage from 140½ miles to 189 miles. From the Thames to Birmingham, 135 miles, 93 miles are Grand Junction, the remaining 42 miles is along canals owned by three companies.

The report of the Parliamentary Committee of 1872 put a stop to the capture of canals by railway companies, but very few remedial measures have followed it. The purchase of the

Wilts and Berks Canal by traders, the Act transferring the canals from Sheffield to the Humber from the railway company to an independent company, and the transfer of the Thames and Severn, which had become almost derelict in the hands of the Great Western Railway, to a public trust, are almost the only examples. County Councils appear to be taking a certain amount of interest in the question, as shown by the Thames and Severn Act, 1895, and also by the new constitution of the Weaver Trust, in which the Cheshire County Council and two District Councils have been accorded a commanding influence, while the position of the toll payers has been made much stronger than before.

It is clear that some means of quickening the process of re-organisation must be adopted or the canal system will remain in its present unsatisfactory condition.

The traffic by canal although relatively small as compared with the enormous traffic by railway, is, nevertheless, considerable, and is far larger than the tonnage carried on the French canals, although they are double the length.

Germany has an aggregate length of 7,366 miles of inland waterways, and is paying great attention to the development of traffic thereon.

Before railways gave us the means of improved communication not only goods but passengers were carried on canals. This proves that there is no necessity for the sluggishness which is generally supposed to be connected with transit by canal, and there is no reason why agricultural products should not be moved by water to a considerable extent, as is the case in the north of France.

Before any national movement is commenced more reliable information is needed, and the Board of Trade should put in force the power given them by the Act of 1888 to call for a return which would bring out the facts with reference to canals and traffic carried on them at the present time. We should then have facts to guide us, and with these at hand, a public inquiry by Royal Commission should be held to crystallise them. At present it is practically impossible to organise traffic economically, companies are numerous and canals were made with utter disregard to uniform dimensions in days when bar tolls and restrictions were looked upon as the acme of commercial acuteness. Uniformity of gauge was soon found to be necessary on railways, and has been achieved in spite of the great expense involved in making the change, and it is acknowledged that without the uniformity of gauge the traffic of the present day could not be dealt with.

Canals with few exceptions remain as they were when first made, differing in length and width of locks and depth and width of waterway, without organisation or any recognised map showing where traffic can by any possibility be conducted.

Good organisation is a *sine quâ non* in all business transactions of magnitude in these days of fierce competition; on all sides small undertakings are being swallowed up by large ones. It is of great importance that canals should cease to be an exception: amalgamation must be carried out as thoroughly, or perhaps more thoroughly, than it has been by railways.

My proposals are—

(1) That any advantages offered to stimulate the construction of light railways which are available for the improvement of canals should be secured for them in the same Bill.

(2) That without delay a return of canals and the traffic thereon should be called for, as provided in the Act of 1888.

(3) That, upon the return being printed, an enquiry by Royal Commission should be held to consider the condition of canals and the best means to adopt to render them more useful to the public.

P.S.—Since the above paper was read, the Board of Trade have notified that they will call for a return from canal companies of particulars of their routes and the traffic carried thereon for the year 1897; the return will include several additional particulars, and will no doubt be of much greater value.

“REPORT (TO THE PERUVIAN GEOGRAPHICAL SOCIETY) ON THE NAVIGABILITY OF THE EASTERN RIVERS OF PERU.” By Captain M. MELITON CARVAJAL, of the Peruvian Navy. Lima: Peter Lira, 1896. 12pp., with map.

THIS little tract is useful with the map, showing how far a boat may travel to and into Peru along the waters of the Amazon, Orinoco, and other rivers, thus giving another door into Peru, besides the possibility of trading along the rivers. The following table, being a summary of the observations made, is of considerable value:—

TABLE showing the navigable rivers on Eastern Peru, the limits of their navigation, navigable distances, mean velocity of currents, greatest draught for vessels, and distances between the port of Iquitos and the name of places at the limits of navigation.

Rivers.	Limits of Navigation.			Navigable distance, Miles.	Velocity of the current, Miles.	Draught, Feet.	Distance from Iquitos, Miles.
	Places.	Latitude S.	Longitude W. (1).				
Amazonas..	The beginning	4° 36' 00"	73° 27' 57"	60	3	7	60
Marañon (2)	Borja	4° 28' 30"	73° 30' 40"	392	3	7	453
Huallaga (3)	Achinamisa	6° 28' 30"	75° 55' 10"	197	3	3	501
Ucayali (4)..	The beginning	10° 43' 30"	73° 44' 40"	772	3	3	832
Ucayali (4)..	Mouth of the Pachitea	4° 48' 30"	74° 32' 30"	765	2.80	7	825
Pachitea	The beginning	9° 54' 09"	74° 58' 45"	191	2.50	6	1016
Talcazu	Mayro	9° 55' 22"	75° 17' 45"	36½	3.25	3	1052½
Tambo.....	.....	.....	.....	20	4	3	851
Urubamba..	.....	.....	.....	55	4	3	867

(1) The longitude has been calculated from the meridian of Greenwich.

(2) During the dry season, steamers of 7ft. draught may find it difficult to go farther than 50 miles before reaching Borja; however, for steamers of 5ft. draught, navigation is possible in every season as far as Borja.

(3) The navigation up to Yurimaguas, situated in latitude 5° 51' 55" S., and longitude 75° 59' 58" W., and at 123½ miles distant from the mouth of the Marañon, can be effected by steamers of 7ft. draught, excepting in the dry season, but it is possible by steamers of 5ft. draught.

(4) The Ucayali can be navigated safely by steamers of 7ft. draught all the year round as far as the mouth of the Pachitea.

ELECTRICITY IN THE SERVICE OF MAN.

By Mr. C. A. CLARKE.

[Addressed to the Society, in the Library, Monday, October 12th, 1896.]

THE advance of knowledge in its special relation to electricity has taken such exceptional strides during the last fifty years, that although the science is still in its infancy, more control has been obtained, and a clear perception of the laws that govern electrical movements has enabled men of the present generation to discover more since 1820 than was known during the 2,000 years previously, when an elementary knowledge was limited to the experiments with pieces of amber, which the Greeks found would, when rubbed against other substances, attract some bodies and repel others. The name "electron," the Greek word for amber, originates the term electricity. The Egyptians were acquainted with the various phenomena connected with this visible energy, which they utilised to gull the ignorant and blackmail those whose superstitious fears of what was not understood rendered them easily duped. For 2,000 years scarcely anything was added to this elementary knowledge. Between 1600 A.D. and the commencement of this century very considerable and fundamental discoveries were made, and scientific information was added by innumerable men all over Europe; but very small encouragement was given by the authorities to these inventors, who were, on the contrary, often treated as nihilists or punished for their craft.

The identity of electricity with lightning and thunder was not recognised until Franklin established it by means of his celebrated kite, from which he obtained, during a thunderstorm, electric sparks, identical with those obtained from a Leyden jar. The electricity in the clouds found a good conductor in the wet string of Franklin's famous kite, and was made to spark across an air space by means of an insulated key. It was worthy of note, that Franklin made public his intention of flying a kite during a thunderstorm for the purpose of catching the lightning, and was greeted with a volume of abuse and ridicule. The association of electricity is co-existent with the formation of the earth's surface, but this fact was unknown until 1819, when magnetism was associated with electricity by a Copenhagen scientist (Oersted), which discovery was one of the first magnitude, and marks an epoch in the progress of electrical science, opening the way for its commercial development achieved chiefly through that branch of the science called electro-magnetism.

Electricity as a means of lighting large cities, towns, shops, warehouses, cotton mills and houses, is becoming daily a growing industry of great commercial importance. At least, 300 towns in Great Britain have either a municipal supply of electricity, or it is supplied by private

enterprise. In London alone, there are twenty central supply stations. But Great Britain, as compared with America, or the Continent, is by no means foremost. In submarine telegraphy, and telegraph lines over land, we may claim a leading place. But in its relation to telephonic communication, electric tramways, or power as obtained from electric sources, we are very slow. The fact that the lighting by electricity of 300 towns, and the many unnumbered private installations has become practicable, is due originally to the work of Faraday, who in 1831 gave to the public the result of his researches before the Royal Society. Faraday had discovered a great and important principle. All subsequent developments of the dynamo, which is the one known source of electrical supply that is of any commercial value in giving electric light, have emanated from the discovery of this principle. All electric power for use on tramways, or on water, whether as applied to elevators or for machinery, originates from Faraday's discovered principle, called "Induction." He found that a magnet approached to or withdrawn from a coil of wire, would induce a momentary current of electricity in that wire, and that the direction of such current would be different in each case. Dynamos are now manufactured with huge magnets in varied form, mostly horseshoe in shape, weighing many tons, coiled round with miles and miles of wire.

When the principle of induction is clearly understood, that which had been mysterious and caused expressions of amazement, becomes clear; it is the key that unlocks the door, and reveals reasons for electrical results that have been hidden in utterances of surprise. Induction may be said to be the cause of the aurora borealis and also of lightning with its contingent report, thunder, and at the conclusion of this paper a short description of how currents of electricity induced form a thunder cloud may be interesting. Again referring to the telephone, induction is the main trouble of clear and distinct communication. The babel of voices heard through a telephone receiver on a busy day in any city, is caused by induction. In 1854, Siemens improved on the dynamo, and at about the same time, a Manchester man, named Wilde, used for the time, an electro magnet—that is, first a piece of iron, temporarily magnetised when an electric current passes through the wire coiled round it; in this soft iron there is always retained a residuum of magnetism, and the action of a revolving armature near to its poles is quite sufficient to rouse the latent force to full activity. The feeble magnetism suffices to induce a current in the wire of a moving armature, and thus re-acts upon the magnet with a reciprocal action going on until both are overloaded with electricity. The continuity of the motion is mainly obtained by means of a commutator or switch, which reverses the current in one part of the circuit twice during each period, so that the electro-motive force of induction be at each instant in the opposite direction to that of the exciting current. To a terminal on the dynamo a cable is connected and continued along the streets of the town or the walls of a building to be lighted and again brought back to the dynamo and connected to the opposite terminal. The current after passing along wherever the wire is laid returns, like the water conducted from a mountain stream, in order to flow through mills turning turbines after doing its work,

returns at a point lower down to the stream from which it was caused to flow. Power of some kind must be obtained to revolve the armature of a dynamo, and to maintain the flow of electricity. In England, steam power is mostly used. In Scotland also, but there is a disposition now in the Highlands of Scotland to turn the numerous waterfalls to some use in this direction. If care be taken, the benefits of electric lighting at little cost that many of the pretty Scotch villages may enjoy without disfiguring their scenery so much as is necessary to fix a gasometer, and supply gas, by means of turbines to turn the dynamo are not fully recognised. At present, most of the numerous waterfalls are running wasted power, while the villagers permeate their atmosphere with a vile smell of paraffin oil or coal gas. In America, however, the rivers have been utilised for turning turbines to some extent, the most remarkable instance perhaps being that of Niagara Falls. When Max O'Rell visited America in 1889, he says "the noise of these falls can be heard at Buffalo, thirty miles away." In November this year, it is expected Buffalo city will be lighted, and power obtained to the extent of 10,000 horse power from the falls. Max O'Rell goes on to say: "I went down by the cable car to a level with the rapids where Captain Webb was last seen alive. It was thrilling to stand within touching distance of that great torrent of water, and to hear the roar as it fell. The idea of force it gives one is tremendous. You stand and wonder how many ages it has been roaring on, what eyes besides your own have gazed awestruck at its mighty rushing, and wonder if the pigmies will ever do what they say they will; one day make those mighty columns of water their servants, to turn wheels at their bidding." In 1895 the pigmies did it, and then one turbine was successfully erected; since, two others have been fixed, and the work of laying conductors is now proceeding. At Niagara, a surface canal was excavated a few miles above the falls; about 200 feet beneath the surface of the ground, a tunnel has been bored which runs to an open point below the "Falls near to the Clifton Bridge;" a large wheel pit is excavated at the side of the canal leading to the tunnel. Large steel pipes are laid down the wheel pit, and deliver a head of 140 feet of water on to turbines situated on the level of the tunnel, which generates the mechanical power. The lines of tramways communication to Buffalo city, and the several large aluminium works in Niagara city, the electric lighting of the city, and all the tram lines are supplied with power from the mighty generators. The Gorge Railroad, which runs alongside the river for seven miles, and passes the most lovely scenery and the torrent made famous at this spot, being the scene of attempted trips in barrels, some of them successful—these railroad cars are all worked by power from the river. Two 50 horse power generators supply the current at a pressure of 500 volts. About 250 towns in Europe have now electric cars, and in Great Britain there is a lively recognition amongst the profession how much superior, looked at from every point of view, electric cars are to any other means of tramway communication. The question of system is one that must be decided when the district and environment is considered.

In Douglas, Isle of Man, there is an overhead trolley system, also in Walsall and Leeds, and several towns in the South of England. In

Glasgow, where the subject is now under discussion, no doubt the conduit system, something similar to that at Blackpool, will be adopted, but the lucky committee have been sent on a trip to the United States to see and return with a report. The road from Stretford to Peel Causeway would make an ideal electric tramway track, and will shortly be taken up for consideration. The sooner they are adopted in Manchester, the sooner will be dispensed with the humorous scavenger boys, whose lives are risked every minute of every day, and the sooner the streets will be cleaner, the atmosphere less polluted, and, what is oftentimes a cruel strain on horses, when restarting every few minutes on a wet day with a full load, will be avoided altogether. It is true that with a conduit system of tramways, will arise the necessity of laying a metallic return instead of using the rails as a certain circuit as has been done, or sometimes the return has been allowed to run to earth, in which case the telegraph instruments of the Government are rendered inaccurate, and in one case the disturbance was such as to have an effect on telegraph instruments over a distance of more than 120 miles. This occurred a few years ago, when the London Electric Railway caused a violent fluctuation of instruments in the post office at North Walsham, in Norfolk.

The use of the electro-magnet for lifting heavy iron rails or bars is a branch of the subject not yet much developed. A powerful horse-shoe shaped electro-magnet has been in use some time at the Sandycroft Engineering Works. It will be understood how simple is its working when by lowering the chain of a crane to which an electro-magnet is attached, and touching an iron bar of say $1\frac{1}{2}$ ton, the attendant by moving a switch at once fixes the iron bar to the magnet, which is then raised and swung round on to the truck and swivelled into position, the current switched off the weight of iron is instantly released. No chains nor clamps are required to secure the weight to the magnet, and it is admitted that five times the quantity of work can be done in the time required to do it with mechanical contrivances. It may be mentioned that electric cranes are used at the Arsenal, in Woolwich, for raising and stacking heavy shot. Take another branch of electricity, that of electric welding, and perhaps there is more scope for development than any other. In 1851, Joule recognised the value of the intense heating effect of electricity, and made use of it. Availing himself of the extraordinary high temperature of the electric arc, Sir William Siemens made an electric heating furnace. At the works of the well-known firm of tube makers, Lloyd and Lloyd, an electric welding apparatus is used, and with regard to tube sections, work that once took the smith and two strikers an hour, can be accomplished in six minutes with the electric welding machine. But the real advantage, economical though it is, lies in being able to secure by electricity an absolutely reliable result. In the welding of bicycle tyres, it takes thirty minutes to weld one tyre by the ordinary system, while with the electrical process, six can be done in that time, and, what is more important, the electrical weld is stronger, safer, and without being able to detect the join. The method of heating consists in passing an electric current of great volume, by means of two copper clamps, through the two pieces that are to be welded together by mechanical pressure. A smith sent a report a few weeks since stating that a

2 inch counter shafting had broken, and caused twenty men to cease work until it was made right again: the shaft was taken down, and the pulleys stripped from it, it was placed together by the electric welder, and the men were working again in less than half-an-hour. There is an announcement made by a Russian scientist, who, as I believe arrived in London, that he is going to show how it is possible to speak to New York from London over the submarine cable. This is at present impossible, and only the uninitiated reporter would have printed such a statement. If no difficulty other than the fact that there are three distinct sections on the London and New York line, worked by three different sets of instruments, which alone renders the feat impossible, there are at the present insurmountable obstacles of induction, retardation, earth currents, etc.

It is hardly complete to conclude without mentioning the discovery of the present year, known as the Röntgen X rays. The invention is not purely and entirely new, but the knowledge was so imperfect as to render the process possible only to the inner circle of scientific electricians. Now it is known that, with the use of a Newton focus tube similar to the one shown, Professor Rontgen found by forcing a current of electricity through this vacuum tube, that certain invisible rays of light could be directed so as to penetrate opaque and solid substances, and that if these substances were placed on an ordinary negative photographic plate, an impression of what was inside the opaque substance could be seen on the negative plate and electrographed. This discovery will be a blessing to the maimed and injured, also to veterinary surgeons, who have already proved it to be an invaluable and important means of detecting the nature of sprains and accidents to horses. Dr. Mackintyre, of Glasgow, whose name was mentioned in Liverpool, at the British Association by the president (Sir Joseph Lister), in connection with the X ray process of photography, showed me six months ago a photo of an arm, full length, not merely showing the bone, but the flesh was to be seen sufficiently distinct for certain surgical purposes: this is mentioned because it was first thought that only substances of a hard nature could be seen on a photo by the X ray process, and that since, I believe, the same doctor has been successful in showing the heart and lungs of a living subject.

Referring to the formation of a thunder cloud, it is done by the accumulation of infinitesimal drops of water. The separate drops become electrified by friction with the earth's surface and elevated objects, such as trees, rocks, etc., and as they become condensed into larger drops, the extent of the surface in proportion to volume is reduced, and the electricity, which always accumulates only on the surface, is, on this reduced surface, proportionally increased. Two drops for instance condensed into one, have the same quantity of water and electricity as was contained in the two, but much less surface area, and consequently a higher electric surface potential, or we may say the negative electricity is eager to fly to where there is more room to rest. These drops, however, continually increase, forming a mist, and then a (thunder) cloud, so surcharged with electricity that the atmosphere between the cloud and the earth is insufficient to resist the law of electricity, which is that unlike (or positive and negative) poles always attract each other and like poles repel. The electricity of the earth

being of opposite polarity to that of the clouds, the atmosphere, which offers a certain resistance, is not sufficient to resist the negative electricity of the cloud from rushing to meet the positive electricity of the earth; this it does by sparking across the air space, which is the flash we see, taking the shortest cut perhaps to a church spire, or to a tree, or it may be down a copper conductor running from the top of a mill chimney harmlessly to the earth. When the line of discharge is visible it is termed forked lightning; when obscured by intervening clouds, sheet lightning; and when illumination rises from distant clouds below the horizon, as it does sometimes on summer evenings, it is termed heat lightning. Crookedness is due doubtless to the difference of resistance encountered at different points in the air.

While expressing the hope that this paper has not been without interest, it might be observed that amongst the difficulties experienced in the endeavour to comprehend the real nature of electricity, is the absence of what may be called an electrical sense. We should be equally baffled in our attempt to understand the meaning of weight, heat and cold, sound and light, etc., were it not for the unconscious experiences in childhood and early years. With the nature of these we are familiar. It is only by cultivating this new sense aroused to enable the mind to grapple with new phenomena that a real grasp of the laws of electricity can be obtained, and the terms, volt, ampère, ohm, resistance, and potential, which now create the haziest of notions, will become clear.

Since this paper was read before the Manchester Geographical Society, a statement has been made by the chairman of the Electricity Committee of the Manchester Corporation: March 10th, 1897. At a social gathering in Liverpool it was announced that on the expiration of the present lease of the Manchester Carriage Company, will end (so far as Manchester is concerned) the drawing of ears by horses. What may be added to the methods of car propulsion by the time of the expiration of the lease in 1901, we cannot say. Overhead wires are not suitable for electric traction in large towns, and the objections against the conduit electrical system are much less than they were.

“COMPENDIO DE GEOGRAFÍA DE LA REPÚBLICA DE COLOMBIA (SUD-AMÉRICA).” Par Professor M. Díaz Lemos, Director de la Escuela Normal de Institutores de Antioquia. Quinta edition. Barcelona: 1895. Henrich & Co.

THIS is a small book of 136 pages, illustrated with views and a small but fairly clear map of the republic. The book is divided into 70 lessons, and gives the natural features, the productions, population, trade, &c. in the following order:—Astronomical geography, physical, political, and the general geography of Colombia. In the same way the departments of the republic are dealt with in more detail (and topographically) than in the general sketch. Antioquia, Bolivar, Boyacá, Cauca, Cundinamarca, Magdalena, Panamá Santandar, and Tolima. The information given is most interesting, and often surprising, and we are very much obliged to our member, the author, for sending to the Society this useful and very valuable compendium. The members who refer to the geography will find many useful hints in reference to productions and trade, and there will now be no excuse for any of them remaining ignorant that Panamá is in Colombia. It has been exceedingly well spoken of by a number of experts, and we are glad to give our appreciation of the small volume. Señor Lemos gives the population at 4,000,000, and Indians as 220,000.

THE EARTHQUAKES IN ICELAND, 1896.

(See Map.)

By Mr. JOHN R. NEWBY.

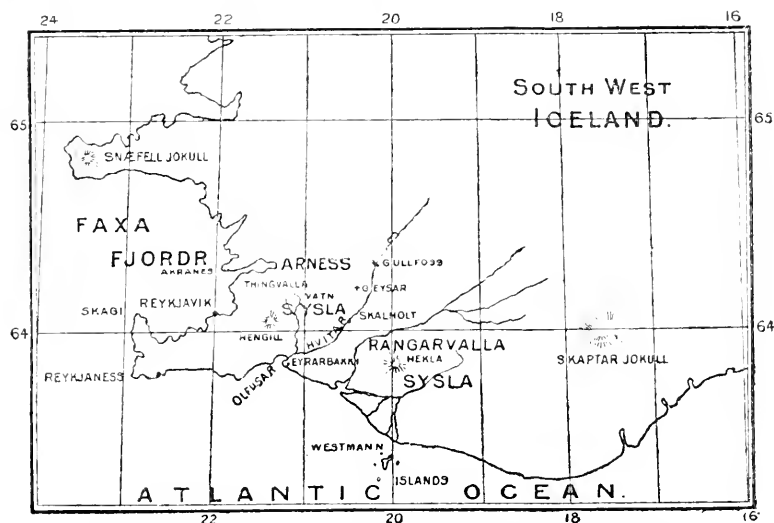
[Read to the Members, in the Library, Wednesday, December 16th, 1896.]

AT the end of October, 1896, I arrived at Leith, N.B., from Reykjavik, in the Royal Danish mail steamer "Laura," in which vessel I left the same port for Iceland on the 26th of September. Many unintelligible and contradictory statements had appeared in English newspapers as to the recent earthquakes, and one of my reasons for re-visiting Iceland at so late a period of the year, was to ascertain from personal observation and from reliable sources the actual facts connected with the disturbances which took place in the island in the months of August and September of that year, and the results.

The "Laura" was timed to arrive at Reykjavik on the 2nd of October, but owing to bad weather in the Faroes, and subsequent northerly gales, she did not reach Faxa-fjöldr until seven o'clock on the morning of the 5th of October, having taken no less than fourteen hours, after leaving Reykjanes, to arrive at her anchorage. The wind was so strong on the 5th that communication between the vessel and the shore was out of the question, and the passengers spent the day watching the northerly gale drive the waves over the warehouses of the capital; the streets were flooded, and some vessels in the harbour were wrecked. On the morning of the 6th, the gale had somewhat moderated, and a boat—manned by eight sailors—came off to take the mails on shore; some of the passengers (including myself) took this opportunity of landing, but it was impossible to get any luggage off from the steamer until the following day. I employed my first day on shore in finding out the districts in which the earthquakes had been felt; I also secured the services of Daniel Danielsson, photographer (one of the most experienced English-speaking Icelandic guides), who, at the beginning of September—after the first disturbances occurred—journeyed through the part of the island affected, and I made arrangements with Geir Zæga—well known to all who have visited Iceland—for the hire of ponies for the use of my guide and myself.

In many English papers it was stated that the earthquakes had occurred on the east coast of Iceland, a mis-statement that is thus explained: The Danes are, as a rule, little skilled in the language of Iceland. Icelandic news reaches Copenhagen from Reykjavik, at which latter place all the residents speak of the district around Hekla as "the east," so that the statement of the Reykjavik correspondent that the shocks occurred in the east—after being re-translated into English—

reached us in the form in which it was announced in our papers. The parts chiefly affected are the Rangar Valla Sysla, and the Arness Sysla, both in the south-west. Those who have visited the "Njal Country" from the capital are familiar with this section of the island, and readers who have not travelled in "Ultima Thule" may trace the region where the quakes occurred on this sketch map:—



Sketch of the Earthquake District of Iceland affected in 1896. By Mr. Newby.

The names I mention will be familiar to travellers who have been in the Hekla district and (with the exception of some few farms) are to be found on Gunnlangsson's Map of Iceland, published by Stanford and Co., Charing Cross. In mentioning distances, I refer to English miles, and other measurements are quoted according to the English standard. I heard the first facts as to the disturbances at Klaksvig (in the Faroes) from the Danish captain of a small steamer—the "Oddur," of Eyrarbakki—who came on board our ship on the 1st of October. He told me he was in Eyrarbakki when the first shock was felt shortly after midnight on the 26th of August. He arrived at Klaksvig on the evening of the 30th of September. The earthquake, he said, was preceded by a loud rolling underground sound, not unlike thunder. In consequence of the shock, things in the houses were thrown to the ground, and he, and many others, found the greatest difficulty in keeping their feet. The result was many walls were cracked, but, as the majority of the houses were built principally of timber, the damage was not so disastrous as amongst the farm dwellings built of lava and turf.

There are two sorts of Icelandic farmhouses, one built in great part of timber placed in foundations, and the other in the main constructed of blocks of lava intermixed with turf. The former and better class consist, as a rule, of some six or seven small buildings arranged in a

row, the frontage measuring from 60 to 100 feet. The front of each of the buildings has a wooden gable, painted white. The living room is usually in the centre; on either side are the store-house (for the milk, curds, and cheese), the cow-byre, the hay room, the forge or smithy (where side-saddles, scythes, and instruments of husbandry are stored), and the guest-room. As a rule, the kitchen is at the rear of the buildings. In erecting the other and more common sort of farm-houses, or country dwellings, no foundation is excavated, but four rows of stones are placed on the surface of the ground, and on these are erected wooden pillars (or side supports), usually between five and six feet in height, and placed about a yard apart; outside these, at a distance of six or nine inches, is built a wall of alternate layers of sods and lava blocks, from four to five feet thick at the lower part, and of a less thickness above. The rafters are securely attached to the upper end of the wooden supports, then the roof boards are nailed to the rafters, and over these are placed, first, dry brushwood or moss, and lastly a layer of turf a foot or eighteen inches thick. A cross-tie rod or beam connects the lower end of the rafters, and half-way between this and the apex of the roof is a second and shorter tie rod. It thus happens that in many instances, whilst the rafters are supported by the pillars, the remainder of the roof is resting on, or mainly supported by, the turf wall. The front entrance into the passage (seldom more than five feet eight inches in height) averages about four feet six inches in width, and is floored with stone or made of earth. It runs from front to back of the house, and is quite dark; on either side of it is a square room about four and a half feet in height. These rooms vary in size according to the circumstances of the proprietor. If he is well off they are wainscoated and floored with boards, and contain a table, a couple of chairs, and the family trunks or chests (many of them very old), the latter are placed round the room and frequently serve as substitutes for chairs. Sometimes above these two rooms is a dwelling-loft, where all the family sleep in bunks ranged round the sides; when there is no upper floor the sleeping boxes are arranged in the lower dwelling-room at the back of the premises. On one side of the passage is the kitchen, lighted by a hole in the roof, which orifice is also used as a chimney. On the other side of the passage is the dairy, or store-house, for milk and cheese; these back rooms have no wainscoat or plaster. In such a house the front sitting-room is, on the arrival of travellers, often used as the guest-room.

At Eyarbakki the first shock occurred shortly before midnight on the 26th August, the inhabitants hurried out of their houses, and for two or three weeks lived in tents. The captain marked on my map a point about fifteen miles south-west of the Westmann Isles, where the crew of an English steamer were fishing at the end of August. This vessel subsequently put into Eyarbakki, and their captain and the sailors stated that about midnight on August 26th their boat apparently ran on to a rock or some obstacle. The men on deck were thrown down, and glasses and crockery on board were broken. The sea was observed to be troubled for a short time. About the last-named hour on the same day a severe shock—described as lasting about a minute—was felt in the Westmann Isles. No less than five slight shakes occurred during the following day, and many rocks and stones were

dislodged from the cliffs and fell on to the land below and into the sea. Some of the islanders, with their ropes and nets, were engaged in catching sea-birds on the ledges of the cliffs, others were waiting below in boats to receive the birds. When the tremblings were felt, some of the men above clung to the sides of the cliff, others threw themselves face downwards on the ledges, in order to avoid the falling rocks, and the men below rowed their boats away from the land. A large stone fell on one of the men on a ledge, and so injured him in the back that he has since died. Many of the ledges themselves fell during the quakes, and this will prove a loss to the islanders, one of whose means of livelihood is bird catching. The men reported that ten minutes before the largest fall of rock they had been on a ledge further east where a great part of the face of the overhanging cliffs was thrown down, and would have inevitably killed all of them had they remained there. Glass and crockery were destroyed in the houses, but the dwellings themselves sustained very little injury. A slight shock was felt about 9-30 p.m. on the 27th August, and two minutes later there was a severe but short shake. The boat of a Westmann sailor, who was fishing with a line some ten miles south of the Isles, was much shaken and his fishing tackle disarranged. The islanders state that the direction of the tremors was from north-east to south-west.

So far as I could make out, there were (in addition to small shocks) two serious and violent shakes throughout the whole of the south-west district; the first, on the 26th of August, was most severely felt in the Rangar Valla Sysla, and the second, on the 5th of September, principally affected the Arness Sysla. The focus of the disturbance seems to have been about half-way between the Westmann Isles and Reykjavik, and (while all the people describe the waves of the quakes as running from north-east to south-west) the line of the greatest damage seems to be one drawn directly between the capital and Westmann Isles, the centre line of disturbance passing under and through that classic locality known as the "Njál Country," near Bergthorshvoll, on the banks of the Affall River (the home of the peaceful Njál), and not far far from Hlitharendi, where lived the noble-hearted Gunnar and his wife Hallgertha.

On the 8th of October at 8-15, with four ponies, my guide (Daniel) and myself left the Hotel Island, Reykjavik. It was a bright frosty morning, and we were able to ride quickly along the Hekla road. Before going far we overtook a builder making his way on pony-back to "the east" to assist in rebuilding some of the fallen houses. He journeyed along with us for some distance; after two-and-a-half hours riding, we left the road to examine a group of three turf-built farm-houses that had fallen down during the first quake. Daniel had visited them soon after the disturbance, when they were in ruins; then the people were living outside in tents, now the houses are re-built and inhabited again. These people (in addition to the cost of re-erecting their buildings) lost in the downfall many of their winter provisions, and the remainder was much damaged, their butter and skyr were buried under the ruins; they had most of their rye stored in open boxes, and this—buried under the ruins—was found to be spoilt, even when it was possible to recover it. Clothes, both dresses and bed-clothes, were buried. The cows gave 50 per cent less milk in conse-

quence of being out in the open air. The pails and milking utensils were either broken or buried, so that for a while the people were unable to milk their cows. Much hay was lost, the hay-ricks and hay stores having fallen down, and the hay crops, which are usually garnered at the beginning of September, were damaged by rain, and on several farms the cattle were starving for a time.

About an hour after leaving these three farmhouses, we reached the inn at Kolvidarholl. Here we found pasture for the ponies. The house is built of stone and timber, and had sustained but little structural damage; but there were some cracks in the walls, and glass and crockery had been broken during the first shock on the 26th August. The landlord said that the time of the farm servants on the damaged farms was occupied in re-building the dwellings, and often outside aid was required, for which the farmers had to pay. After leaving the inn, we passed across dreary low-lying marsh lands, and gradually ascended Hengill mountain. From the highest part of the road there are fine views in every direction, below is the Hvita river, which, after its junction with River Sog, takes the name of Olfusa. There is an excellent zig-zag road—designed by a Norwegian—leading down into Hellisheithi. In this valley the greater part of the turf farms had been wholly or partially thrown down. Want of time rendered it impossible for me to visit more than one or two of the farms; the results were, in all cases, very similar. The disturbance appears to have so shaken and moved the outer walls that the heavy roof has dropped down between them. Nearly all the outbuildings, consisting of cow-byres and sheep-folds, have fallen down, and are merely heaps of lava stones and turf. Cows and sheep were in many instances killed. Hereabouts some houses in course of construction were destroyed; water appeared where there had before been land; there were numerous rifts in the ground; some hot springs ceased to act; and I was assured that, in many instances, streams and small brooks had changed their course. I visited and photographed what is known in this locality as the "New Geysir." The farmers said it at first erupted as high as 60 feet; now it is merely a pool of very hot water, one part of which bubbles up to a height of 12 or 18 inches. From this vent a great quantity of steam issues, and the smell of sulphur is very strong. After leaving the flat, low-lying land the Hekla road passes beneath Ingallsfjall—a high range of hills, the haunt of ravens and falcons; below were many large masses of recently fallen rocks, and above could be seen the places from which they had been detached. In the road leading to the Olfusa river there were many signs of wide rifts (now repaired). We crossed the river by a suspension bridge—the first erected in the island. One of its approaches had been undermined by the shock, and was now put right; the bridge itself had not suffered. The bridge is 40 miles from Reykjavik. It was half-past four when we reached this point. Daniel said he knew of a first-class farm two hours from here. However, I had had riding enough for the first day, and decided to remain at Selfoss farm, adjoining the bridge. At first the farmer (Gunnar by name) said things were in such a state owing to the earthquakes that I could not be made comfortable. However, I explained any place was good enough for one night, and I was wearied. His house is built of stone and timber, and had not fallen along with

the two adjoining turf dwellings, but the walls were out of perpendicular, many of the doors were off, and the floors and ceilings had a "list" to the south-west; in the guest-room—where I slept—there were several empty picture frames and broken household goods; all the drinking glasses had been smashed. Gunnar said the shock that did most of the damage occurred about 10-30 p.m. on September 5th. Simon, the caretaker of the bridge, who had that day returned from the Hekla district, was in Gunnar's house when the first warning occurred. When Simon was taking off his boots preparatory to going to bed, the two heard a rumbling noise below the house and felt a movement. They were in the dwelling-room at the back of the house, and got out as quickly as they could by one of the windows. They then rescued the rest of the people who were in bed, in a half naked state, and warned the folks in the two other houses. In the house adjoining that of Gunnar lived a farmer and his wife, both between 50 and 60. When told to leave the house, they would not get out of bed. The last words the husband uttered were to the effect that the house would not fall, and they were safe. The roof and rafters fell in, and the couple were buried under the ruins. The night was pitch dark, and it took some time to find any picks and tools to remove the roof, which, being an old one, was at least two feet thick. The groans of the unfortunate pair were heard for a short time; when the bodies were recovered it was found that death had been caused by suffocation. The third house was all in ruins. On the morning of the 9th I took some photographs of the fallen houses, and of the building in which I had enjoyed a good night's rest. Simon, who accompanied me, drew my attention to the fact that both the houses destroyed had fallen towards the south-west. Taking me alongside the river, he pointed out several recently formed rifts, varying in width from five feet to eighteen inches.

I noticed a cat and kitten in the dwelling-room. Gunnar said the latter was three weeks old on the day of the earthquake. During the afternoon of that day the cat was seen to take the kitten in her mouth and carry it out of the house. Nothing more was seen of either of them until after the disturbance, when both cat and kitten were found in one of the turf sheep huts or folds that had fallen in. Neither were in any way hurt. They were brought into the house, and have remained there quietly ever since. Simon said that the ravens living in the mountains of Ingallsfjall go down regularly every morning to the sea coast to get fish and food. The sailors and people on the coast noticed that they came as usual on the morning of September 5th; during the day they croaked more than usual and formed into groups, and on that evening they did not leave the sea-shore as had been their habit.

Resuming our journey along the Hekla road for several miles the ruined farmsteads presented the same appearance as those at Selfoss. The greater part of the sheep-folds had fallen in, and were mere heaps of stone and turf. One farmer and his wife were awakened by the shock, and managed to escape from the dwelling-room by a window; the servants were sleeping at the other end of the room, which the farmer found had fallen in, burying the servants in the ruins. He ran to the next farm and obtained implements and aid, and the servants (who were nearly suffocated) were rescued. Besides this, there were numerous narrow escapes from death in this district. The wife of one

farmer whose house had tumbled had been confined an hour before the first shock on the 26th August, and was with difficulty rescued and lodged in a tent; she and her offspring were none the worse, I learnt. After three hours riding we left the Hekla road and crossed to the north side of the Hvita river by a ferry boat, the ponies swimming across after us. The ice for some yards from the banks was an inch and a half thick, and there was a good deal of floating ice in the stream. We next passed by a track under a high range of hills, from the sides of which, overhead, huge masses of rock had fallen, and then hurrying across frozen marsh-lands and streams, which are impassable in wet weather, we made a short cut to Hjahaholt, the residence of one of the most wealthy farmers in Arness Sysla. He was pleased to see us, and provided our ponies (that had now got warm in the bright sunshine) with hay, and ourselves with coffee and cakes. The stove in the guest-room was lying on the floor in the position it assumed after the quake which occurred about 10-30 on September 5th. This shock made several cracks in the wall of the store-house and smithy—photographs of which buildings I took—otherwise the buildings, which were of a substantial character, suffered little damage. All the sheep-folds about this part are in ruins. We continued our ride alongside the Hvita for a couple of hours, crossing several streams, the ice on many of which was sufficiently strong to bear pony and rider. In this low-lying ground there were many plovers and curlews. After reaching the junction of the Bruara river with the Hvita, we crossed some high ground on the west side of the former stream, and, after eight hours in the saddle, reached the parsonage of Mosfell at a quarter to six.

Sirra Stefansson welcomed us to his house. Both earthquakes had been felt here. The farmers left their houses and resided in tents for two or three weeks; the parson and his family did not turn out. The church was uninjured, but many churches about here were shaken out of the perpendicular. In one churchyard a monument, erected in memory of a late incumbent, was thrown down, and damaged the adjoining gravestones. Owing to the servants having to repair dwellings and outbuildings the hay could not be got in at the usual time, and this was the more serious, as about this part of Iceland the beginning of the present season had been unfavourable, and September was the best September that had been known hereabouts for many years past. In the swamps we crossed over the cotton grass (*Eriophorum angustifolium*) flourishes, and the white fleecy seeds fluttering in the wind to some extent relieved the monotony of the scene. The doctor of the district lost all his winter stock of medicine owing to his cupboards and medicine chests being thrown down.

On the morning of the 10th we made an early start for Austurhlith, crossing the Bruara river—here a rapid stream—by ferry, the ponies swimming. We had some tiring riding over frozen swamps to Mickholt, where we got some hay for the ponies. The earthquake had thrown down most of the sheep-folds, but had not done much harm to the houses. It was bright and fine when we reached Austurhlith, and I went on to the high ground and took some pictures of the surrounding mountains, the summits of which were covered with snow. Since leaving Selfoss we had never lost sight of Hekla, now wholly covered with fresh snow, which glistened in the sunshine.

The morning of Sunday, the 11th, was not nearly so bright as the previous days. We rode over to the geysirs, reaching there about 9-30. Within five minutes of our arrival the Great Geysir erupted. On our arrival sounds like underground thunder were to be heard, followed by two considerable overflows from the basin, a great deal of steam issuing from the vent just before and during the display. Daniel was, on the night of the 26th September, in a tent close by the Great Geysir, and heard the loud underground rumblings that preceded the earthquake—the latter overturned all the boxes in the tent. The next morning he and his companion found that a new geyser or vent had appeared in the hillside to the north of the Great Geysir, and that is now ejecting a great deal of steam and some bright blue water. At first the water erupted was very muddy. This is not the only alteration that has occurred since the disturbances. The Great Geysir, I was told by a farmer, now goes up regularly two or three times each day. The bore of Strokr is full of still water, and this geyser has never erupted since the quakes, nor has any movement of the water been noticed. Blesi is active, and giving off so much steam that its beauties cannot be seen. Geologists may be able to account for these changes on hearing the facts, but many Icelanders, who have spoken to me on the subject, expressed their regret that no geologist—skilled especially in the matter of water volcanoes—had paid a visit to Haukadalr with a view of ascertaining so far as possible how the late disturbances have affected the shafts leading down into the earth, and why it is that alterations have taken place in the intervals of the eruptions.

Crossing the Tingulfjot river on our ponies the water reached the middle of our saddle flaps, and we found the current stronger and faster than that of the other streams we had forded. The earthquakes had been felt at the halfway farmhouse where we called to bait our ponies, but nothing except outbuildings had been thrown down. The falls of Gullfoss (on the Hvítá, which I had not before seen, amply repaid me for riding over the loose, heavy sandy country that separates them from the geysirs. The rocks on either side and in the centre of the falls were covered with lumps of ice and icicles formed by the spray, and the stream itself was full of water. I only hope the midday light was sufficiently strong to have enabled me to obtain some good sun pictures. We had excellent views of the snowfields of Lang Jokull, Bláfell (with its steep side and flat top), and many sharp snow-clad peaks. We returned to Geysir, and the subterranean thunder, accompanied by the rising of water in the basin until it rushed over the sides of the sinter mound, and the enormous clouds of rushing vapour outpoured led me to believe I was going to witness a second eruption: but it all ended in steam, and we returned to our most comfortable quarters at Austurhlith.

During the night the barometer and thermometer both fell, and sleet was coming down on the morning of the 12th when we started at a quarter to eight for Thingvalla Vatn. The thaw had made the roads very heavy for the ponies, and it took us four hours to reach Laugar Vatn (Hot Spring Lake). The same people were living at Kalfstindar farm as when I last visited the lake in 1893. They had heard the rumblings of both earthquakes and had felt the tremors, but no harm had resulted. Now rain came on, and the journey around Thingvalla

Vatn to the parsonage was wearisome, laborious for the ponies, and damp. Very pleased we were on our arrival to see some fresh caught lake trout lying on a slab, some of which excellent fish we had for our evening meal. In this part both earthquakes were slightly felt, the rumbling noises, lasting (at intervals) as long as a quarter of an hour, were repeatedly heard. The water in the rifts around the Logberg and throughout the Thingstead, generally so clear and bright, during the quakes became muddy and undrinkable.

It continued to thaw rapidly during the night, and when we crossed the Oxara river, on the morning of the 13th, it was as much as our ponies could do to keep their footing. *Tempora mutantur!* We found some fifty workmen busy blasting the walls of Almannagja and forming a carriage road; already a Frenchman had ridden on a bicycle from the capital to the famous rift. It was very hard work making progress along the new road after the heavy rain, which continued most of the day. The monotony of the journey was broken at times by our meeting caravans of ponies carrying boards, corrugated iron, and other materials to be used in repairing and rebuilding the houses disturbed by the quakes. It took us seven hours and a quarter to reach the Hotel Island. In 1893 (when the greater part of the track was over lava rocks) I travelled from Thingvalla to Reykjavik in a little over five hours. So ended my six days' ride.

In Reykjavik the quakes on August 26th and 27th, and that of the 5th of September, were felt shortly before midnight. Crockery, glass, and domestic utensils were displaced: chandeliers and lamps were set swinging: some chimneys were damaged. Many residents left the first floor of their houses. The Governor, and some five or six of the inhabitants, set up tents in the square, but much use does not seem to have been made of these. No serious structural damage occurred. At Akranes, north-west of the town, there was a large landslip. I heard of no disturbance further north. The apparent discrepancy between the time when the tremors were felt in Reykjavik and the farming districts in "the east" is accounted for by the singular custom of the farmers called "Boomans-klucka" (farmer's clock). The employer of farm labour in Iceland during the late summer and early autumn always keeps his clock one-and-a-half or two hours ahead of the correct time, and so he gets more work in daylight out of his employees during this part of the year, and saves lamp oil. The labourers are well aware of the custom.

I had conversations with three editors of Reykjavik newspapers, all of whom had, during or since the earthquakes, travelled in the districts affected. In one district, or commune, of Rangarvalla Sysla no building was left standing, except the church and the meeting house, and the foundations of these buildings were damaged. I also had many opportunities of talking with my friends, the British Consul, the Rector of the Latin College, Messrs Tuode and Sigfus Eymundson, and with other well-known residents, and I ascertained that about 150 houses had been destroyed or materially damaged by the recent disturbances. Nearly one hundred of the farmers' children are now in homes in Reykjavik and the neighbourhood.

After my ride I had, owing to strong northerly gales, to wait in the capital for nine days before a steamer left for England.

PRACTICAL GEOGRAPHY IN MANCHESTER.

By Mr. J. HOWARD REED, Member of Council, and Hon. Sec. ("Victorians.")

Read before Section E, British Association, at Liverpool, 1896.

IT has been suggested to the author that a few notes, drawing attention to a recent geographical development in Manchester, may be of interest to the members of the British Association.

The Manchester Geographical Society has abundantly proved that there is little difficulty in awakening an intelligent interest among the people in various branches of geography. Probably no department of learning, when properly taught, is more fascinating.

During the past few years geographical interest has grown up among the masses in Manchester and the surrounding districts in a manner, probably, quite unparalleled in any other part of the country.

Some years back Mr. Eli Sowerbutts, the indefatigable secretary of the Geographical Society, who has done much to popularise geography in Lancashire and the neighbouring counties, gave occasional geographical lectures on behalf of various organisations in the Manchester district. So able and popular were these addresses that the demand for them increased each winter, until it became a greater task than any one individual could possibly undertake.

At this juncture several members of the Society, who had previously devoted their leisure to practical geographical work, came to the assistance of Mr. Sowerbutts. Having first organised during the Jubilee year (1887) they called themselves "Victorians." These volunteers, forming a sort of inner circle or committee of the Society, have existed as a voluntary body of practical geographers ever since, although their membership has been considerably changed, their numbers increased, and their work amplified.

As the demand for addresses became greater other members were prompted to join this working section and assist in the work. At the present moment the lecturing body includes the Chairman, several other members of the Council, and a number of other prominent members of the Society, all geographical experts and practised speakers. Much success has attended their efforts.

The lectures are given in a popular manner, and are nearly all illustrated with lime-light views, over ninety-two per cent of those given last winter having been illustrated in this manner. In the few cases where the lantern has not been used, the addresses have been illustrated with large maps and diagrams, in most cases specially drawn.

During the past five years over 300 lectures have been delivered in Manchester and various towns in the four counties of Lancashire, Yorkshire, Cheshire, and Derbyshire, and even in more remote places.

The audiences have varied from, perhaps, 50 to quite 1,200 persons, with a probable average of 300 at each meeting. It may be calculated, therefore, that the numbers of persons reached has exceeded 90,000.* The hearers have been mostly of the working classes, but not entirely so, many of the meetings having been held under the auspices of various well-known literary and scientific clubs.

Most of the Industrial Co-operative Societies in the districts referred to have an education department connected with their organisations, and spend a regular proportion of their profits on fostering education. One of the methods they adopt, in furtherance of this object, is the organisation of public lectures on various educational topics. These authorities have very largely availed themselves of the facilities afforded by the Manchester Geographical Society, and are doing so each year in an increasing degree.

A number of public organisations, such as free library committees, literary and scientific clubs, and educational bodies have affiliated themselves with the Geographical Society, mainly for the privilege which it gives them of obtaining lectures on the same terms as members of the Society. Under the auspices of these bodies many most successful geographical meetings have been held.

A local organisation, known as the Working Men's Clubs' Association (a public-spirited institution carried on for the purpose of assisting in the foundation of working men's clubs, and in the provision of popular and instructive lectures), has also received much assistance. In view of the useful work undertaken by this Association, the Society's lecturers have placed themselves at its service on the same conditions as apply to the members of their own Society. The result has been that a large number of very encouraging meetings have been addressed.

The kinds of audiences met with under these auspices are very various, and include the members of literary and scientific societies of the more struggling order, of working men's political clubs of both shades of politics, co-operative societies, lads' clubs, etc.

A considerable number of addresses have been given in connection with Evening Continuation Schools. These have been specially successful, much appreciated by the students and school managers, and have met with warm encomiums from Government School Inspectors when they have been, unexpectedly, present. This special class of work is coming into greater demand, and is expected to increase considerably in future seasons.

Other meetings have been addressed at the request of members of the Geographical Society, on behalf of various educational, social, and philanthropic organisations. Several geographical lectures to children have also been given, and have met with much appreciation.

In addressing these meetings the lecturers do their best to spread correct views of geography from its scientific, educational, and commercial aspects. There is, without doubt, a very wide field for valuable work in this direction. Those who have been engaged in the task have frequently been struck with the great need for the spread of geographical

* During the winter of 1896-97, and since this paper was prepared, between seventy and eighty further meetings have been addressed. The audiences in the aggregate will have numbered more than 20,000 hearers.

information, and have more than ever realised the necessity for organised effort. They are convinced that their own endeavours have not been in vain, though they fall far short of what is needed.

An outline of a few of the lectures, delivered during the last season, will perhaps give the best idea of the kind of subjects brought before popular audiences, and of the manner in which they are treated. As an example of an address on Physical Geography, a lecture entitled, "The Shaping of the Earth's Surface by Water Action" might be noticed. Under this title, and with the aid of a fine collection of slides, made from photographs gathered from various parts of the world, the lecturer explains the changes which are gradually taking place on the face of the globe from the wearing effects of water. The denuding action of rain, snow, and ice; the dissolving effect of underground waters and the formation of springs; the origin, and the carrying and carving action of brooks and rivers; and the influence of tides and waves on coast lands, are all dealt with. Many of the audience probably learn for the first time some of the secrets of Nature, and are given a knowledge of facts of which they before were more or less ignorant. The building up of a landscape by the washing down of material from higher lands, the deposition of mud and sandbanks, and the formation of river deltas are also explained and illustrated.

"Our Earth on Paper" is the title of an address designed to awaken curiosity and attract an audience. "Map Projection" would most likely be the title if the audience were that of some scientific club. By prefacing the address with a historic sketch, dealing with the views of the Ancients regarding the earth, it is possible to interest an intelligent audience. Without troubling his hearers with mathematics, or hard names, a lecturer can explain the principles of orthographic, stereographic, and globular projection, the plotting of true conical maps, or those on the systems of either Bonne or Flamsteed. The construction and use of Mercator's Chart, and wherein it differs from ordinary cylindrical projection, can also be made clear, interesting, and popular.

"India," in the hands of a lecturer who knows his subject, will hold a popular audience spell-bound, whether the speaker addresses himself to general geography, the rivers, the mountains, the people, the products, the great cities, the antiquities, the influence of British occupation, or to a combination of any of these branches.

"China, Corea, and Japan" is the title of a lecture which has been very popular during the past two winters. The lecturer who takes this subject gives a brief but graphic sketch of the general geographical features of the three countries, and of their relationship to one another, both geographically and historically. He explains the special characteristics of their peoples and methods of government. The objects, progress, and results of the recent war are also touched upon. The future commercial developments and competitions of the advancing civilisations of the East with Europe also afford instructive topics, brimful of interest for industrial populations.

"Polar Exploration" has been specially popular with Lancashire audiences. Keen delight is taken by them in reviewing the work of Davis, Franklin, and Nares, and they follow the projects of Jackson, Nansen, and Dr. Andr  e with increasing interest.

"Across the Rocky Mountains" is an address which has evoked much interest. The speaker who deals with this subject has been very successful in leading his audience in imagination through a long tour which he himself has made. He succeeds, also, in acquainting them with a number of American cities, and of the part they play in the commercial economy, thus teaching invaluable lessons in Commercial Geography.

"Canada," and "From Liverpool to Vancouver," are also treated much in the same way. The consideration of the social and commercial developments of so important a British territory awakens considerable interest, and does much to enlarge the views of an intelligent audience.

Lectures on any African subject are everywhere found to be popular, and nearly always draw large audiences. "Across Africa with Stanley" has been especially in demand, and has afforded many opportunities for imparting geographical information. The Congo River and its tributaries, the "dark forest," the inland plateau, the great lakes, the snow-capped Ruwenzori mountains have all afforded much scope for geographical description. The variety of natural products peculiar to the various districts has been utilised in pointing out the commercial possibilities and requirements. The various tribes and types of peoples to be found throughout the regions, with their special racial peculiarities and tribal customs, have also afforded useful ethnographical lessons.

Such subjects as the "Nile and its Sources" and "Uganda" have met with considerable success, the latter being especially asked for, doubtless in view of the remarkable developments of the past few years, and of the part which that country is likely to play in the opening up of Africa in the immediate future, due to its being the objective of the Mombasa-Victoria Railway.

Such examples might be multiplied to a considerable extent, as the subjects lectured upon now form a list over fifty in number. Enough, however, has been said to give an idea of the scope of the work carried on.

The arrangements for the lectures are all made through an hon. secretary, who receives the applications and makes appointments for the lecturers. All other arrangements are made on the spot by the local authorities for whom the lectures are given. It is, perhaps, worthy of remark that the organisation has been so successful that no hitch has ever occurred, and every engagement has been fulfilled. This is, of course, owing to the energy the voluntary workers have thrown into the undertaking, and to the enthusiasm which has been maintained. As many as four lecturers have been engaged in different towns on the same evening, and it has frequently happened that two, and several times three, meetings, at different places, have been held simultaneously.

The terms and conditions on which the addresses can be procured are very simple. Any member of the Manchester Geographical Society, or any affiliated society, is entitled to make application for lectures during the season. In a large number of cases the lantern apparatus and operator, as well as the lecturer, are supplied by the Society. The services of both lecturer and lantern operator are purely gratuitous. To meet the necessary expenses, inseparable from the carrying on of such a work, a small fee is charged for each lecture. Railway fares, lantern hire and carriage, hire of slides, and other special expenses, are added

when incurred. Any balance left is used for the repair and upkeep of the lantern apparatus, and for the making and purchase of new slides.

It may be mentioned that during the years that this work has been carried on the balances have been sufficient, in the aggregate, to completely cover the cost of the whole lantern plant (including nearly 2,000 lantern slides) of the Manchester Geographical Society, valued, as a whole, at between £70 and £80.

Another important branch of practical work undertaken by the "Victorians" is of a literary character. This consists in the preparation of an annual analysis of the principal papers and articles which appear in the various British, Colonial, and foreign journals added to the Society's library during the year. These at present are some 200 in number, and represent all the leading scientific and literary societies throughout the world.

The analysis is printed year by year in the *Journal* of the Manchester Geographical Society. It forms at once a valuable index, or ready reference, to most of the papers read or communicated to the scientific world, and is of great use to students and scholars.

The arrangement is very simple and the references easy to follow, so that any required paper can be quickly traced, and any special subject followed up.

Maps, pictures, and portraits, connected with the several journals, are treated in the same manner.

This work is, of course, only of value to the few, and does not affect the mass of the people as the lecturing does. It is, however, none the less valuable, and has received the commendation of several high authorities.

Such, in brief, are the facts connected with two branches of geographical work conducted by the workers of the Manchester Society. All lovers of geography, and all who believe in its importance as an educational influence, will, it is thought, consider that what has been done in the Manchester district is a step in the right direction, and that the efforts described in these notes have not been in vain.

The Manchester geographers are conscious that there is ample room for greater development. They hope to continue the work in the future, and, if possible, to more fully occupy the field.

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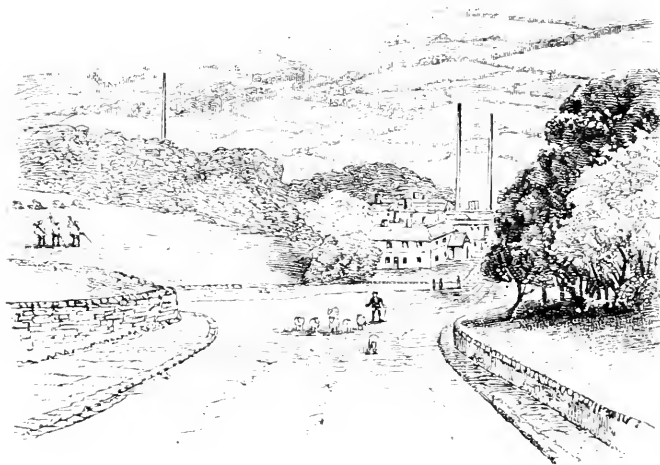
THE difficulty felt by our Society, which led to the analysis of the principal contents of foreign and home Geographical Journals being undertaken by the "Victorians," has evidently been felt elsewhere. We find several societies attempting something of the kind. This is a most elaborate paper of 288pp. It is a great thing for a private publisher to have attempted, for not only is the published article referred to, its author stated, and the name of the Journal given, but some account is given of the authors. The work is very well done, and will be valuable to all geographic experts, and to librarians, but it does not cover the ground. It would appear that more references might be given if the notices of the authors were remitted to another publication, but that is not the opinion of the editor.

THE PHYSICAL GEOGRAPHY OF NORTH-EAST
LANCASHIRE.—(*See Map.*)

By HERBERT BOLTON, F.R.S.E.,

Assistant Keeper, Manchester Museum, Owens College.

[Addressed to the Society, in the Library, Wednesday, April 28th, 1896.]



Entering into Bacup from Stacksteads.

THE district of North-East Lancashire is one which has long attracted the attention of widely different observers. Its people form a type as distinct and rugged as the states and dalesmen of the Lake District. It is remarkable for its wealth of industry, and I think it is no less remarkable for its physical features.

Most of all will even the most casual visitor have been impressed by the heavy rainfall, the steep hills and the wide open moorlands. To the naturalist it is remarkable for deep narrow glens or cloughs, often of surpassing beauty.

The broad outlines of North-East Lancashire have been determined by a set of geological changes which have been somewhat fully investigated. What we may regard as the minor features, owe much of their

character to the action of atmospheric destructive agents operating upon a particular series of rocks.

The district of North-East Lancashire consists of lofty moorlands stretching from Blackburn to Burnley on the north, and from the latter town to Bury on the south. A great portion of it lies above the 1,000ft. datum line, whilst it includes the chain of hills which separate Lancashire and Yorkshire along the eastern side of the former.

The moorlands everywhere descend into steep-sided narrow valleys, and are deeply fissured by a series of ravines which are, perhaps, not exactly paralleled elsewhere.

To thoroughly understand the present geographical conditions we must know something of the surface geology, and of the action of geological processes in past times.

The researches of various geologists have shown that the Carboniferous series of rocks, which occur so abundantly in Lancashire, had once a much greater extension. It can be proved that they were continuous with those of Yorkshire and Derbyshire. What is now known as the South Lancashire Coalfield was part and parcel of the similar coal bearing rocks of Yorkshire and Derbyshire.

This implies that at the period when these deposits were formed, sea and shallow water conditions prevailed over the three counties. During this far away time a great thickness of limestone was formed over the sea floor, and afterwards shales and grits, which last of all gave place to the conditions which made the great coal forests possible.

Many thousand feet of rock were formed in the sea and succeeding lagoons, and it is this vast thickness of rock matter which makes the district of North-East Lancashire to-day.

The Carboniferous system, as the series has been well called, is now divided as follows:—

- Coal Measures.
- Millstone Grits.
- Yoredale Shales.
- Carboniferous Limestone Series.

With the general features of the Carboniferous limestone most of you will be familiar. I will not, therefore, describe it, but ask you to call to mind what you have seen of it at Clitheroe in Lancashire, and Matlock and similar places in Derbyshire.

The Yoredale shales are not so well known. They consist of thin limestone shales and gritty sandstones, which are well exposed on the slopes of Pendle Hill, in the Hebden Bridge Valley, the Vale of Todmorden, and many other places.

The Millstone grits and Coal measures are, however, the most familiar features of the district which we now consider.

The Millstone grit series consist of several thousand feet of sandstone, shale, and thin coals; the Coal measures consist of coal seams, shales, and grits. So far as the rocks themselves go, the chief difference between the Coal measures and the Millstone grit series is in the greater development of coal seams in the former. The Coal measures are usually divided into lower, middle, and upper, the chief coal seams being in the middle series and but few in the upper and lower.

The coals of the lower series are often called "mountain mines," because in the great majority of cases they are in high ground, and can be worked by adits or horizontal tunnels in place of vertical shafts.



ROS-ENDALE. (Reduced from Ordnance Survey.)

From what we have said it will be apparent that at the close of the Coal measure period the rocks of the series were arranged in a regular order, the oldest being the lowest, and at a considerable depth from the surface. To-day we find that the older members of the series usually

occupy the hill ranges, and the geologically upper members lie in the valley bottoms and low grounds. What has taken place to cause this apparent upsetting can be told in a few words.

Professor Hull has (*Quarterly Journal Geological Society*, Vol. XXIV., 1868, p. 323) very clearly demonstrated that at the close of the Carboniferous period the action of crushing forces operated in the production of a series of parallel folds, having an approximate north-north-east and south-south-west direction. Of these folds one was formed along a line passing through the forest of Rossendale, hence it has received the name of the Rossendale Anticlinal. It had the effect of cutting off the northerly portion of the Lancashire coalfield, which came to lie in a hollow between the Rossendale elevation and a similar one which formed the Pendle range of hills. This hollow of coal measures is called a synclinal or trough, and has received the name of the Burnley Coalfield. By this system of folds the high ground was formed which encloses the Burnley, Padiham, and Blackburn valleys.

It can be readily understood that the rocks which formed the tops of the elevated ridges suffered severely during these changes, at the least they would be badly shattered and placed under circumstances favourable for their destruction. As their summits and sides were worn away by the action of erosive agents which we shall consider presently, the geologically lower and older rocks would be exposed, the lowest and oldest of all being on the very summits.

Rocks of Permian age have been found resting in several places (Skillaw Clough and Pendle Range) in Lancashire, upon partially destroyed millstone grits, and this is a certain proof that at the time the Permian was being formed, the district of which we are speaking was more or less below the surface of the sea. It would follow, then, that wave action, currents, tides and storms would all operate upon the folded carboniferous rocks as they descended into and emerged from the sea. The first attempts, therefore, to mould the present physical features of the landscape took place in Permian times, and by folding and marine agency. At the close of the Permian period the rocks were again upheaved, but in a direction somewhat different to that of the first. By the second upheaval the Pennine Chain came into existence, with a direction approximately north and south. Whilst the general upheaval was in the nature of a fold, it was complicated by great fractures or "faults," and one great anticlinal fault of this period has been traced by Professor Hull from Colne on the north through the western slopes of Boulsworth and Black Hambledon, across the vale of Todmorden, onwards to Blackstone Edge and Saddleworth, and as far as Leek, in Staffordshire. On either side of the fault the rocks dip or incline in opposite directions, and it is to all intents and purposes an axis of elevation. It originated the elevated moorlands which separate Lancashire and Yorkshire. The high ground which runs for example from Todmorden by Littleborough, Rochdale and Saddleworth is part of this uplifting. Denuding agents afterwards stripped off the tops of the folds, and thus separated the South Lancashire coalfield from that of Yorkshire and Derbyshire.

The two series of upheavals we have now described have originated the great belt of high ground which forms the greater portion of eastern

and northern Lancashire. The rest of the country is little more than a great plain, flanking these hill ranges on their seaward side.

A third period marked by extreme changes which could not fail to have a pronounced effect upon the district was in Post-Jurassic times. Then arose a vast system of fractures in the coal measures, accompanied by prodigious uplifts and down-throws of strata. In some cases the rocks were cracked across for many miles, and the rocks on one side of the fracture elevated for three or four thousand feet above the other portion.

The main faults of this period run in a north-north-west and south-south-east direction, but they give origin to minor fractures running in all directions. Many faults of this character having a great displacement arose in the Lancashire area, and could not fail to modify the older landscape features.

Since these great upheavals occurred, all or nearly all of the surface features have been swept away, notwithstanding the fact that millions of tons of material would require to be removed before anything approaching a uniformity of surface could be obtained. Professor Hull, who has especially studied this question, is of opinion that the surface must have been depressed again below sea level, so that marine action could once more operate. It is difficult to see how any other agency could have produced the general levelling which undoubtedly took place after the faulting.

So far, we have seen that the main agencies which operated in modifying the surface have operated from within, but they sufficed to block out as it were the broad general features. We now need to consider other agencies which have operated wholly from without.

When the land emerged from the sea in Post-Jurassic time, it probably possessed a great uniformity of surface with no strongly marked features such as hills and valleys. Atmospheric agents would commence to carve out lines of drainage and cut up the prevailing uniformity.

Either before or about the time when man made his first appearance in the northern hemisphere, the climatic conditions in Northern Europe changed considerably; and from some cause as yet not fully understood, the climate became much colder, and indeed of an arctic character. The mountains of Northern England, Scotland, Wales and Ireland became the gathering ground of huge snowfields, which, as they accumulated, passed outwards towards lower levels in the form of glaciers.

Into the general question of the glacial or ice period we cannot enter, but it is certain that North-east Lancashire lay directly in the track of the advancing ice sheet from the Lake District and was covered by it, and that, as the result of the scouring of the rocks by the ice and contained rock fragments, the character of the landscape was much altered. The surface was planed down to some extent, and scored by ice scratches. When the glacial period passed away the land was left littered by a great thickness of clay and rocky fragments which superposed other landscape features upon those already existing. The hill-tops were rounded and passed off into smooth flanks, and what valleys existed in the line of movement of the ice were widened out.

In North-east Lancashire the glacial clay is often many feet in thickness, especially in the valleys, and thins out to nothing as it ascends the

hill slopes, but much which was once on the hill top has been brought into the valleys as the result of a later denudation.

Some valleys in the district we are dealing with seem to have existed prior to the glacial period, for they are filled to a great depth by the boulder clay. Such a one is the Bacup and Broadclough Valley, in which the River Irwell takes its rise.

From observations I was able to carry out several years ago I determined that not less than 20ft. and in some cases nearly 30ft. of stiff boulder clay underlay the river bed in parts of the valley. At Meadows Mill, in the Broadclough Valley, the clay was bored through in the river bed itself, and was found 27ft. thick and resting upon shale. No river gravel of any sort was met with.

It follows, then, that whilst the more prominent surface features were toned down, pre-existing valleys were partially obliterated by the accumulation of glacial debris in the Ice Age; and, although these valleys are still the lines of main drainage, their true depth and importance are not at first sight evident.

The last set of causes which have had their influence upon the physical geography are those which are operating to-day. Briefly, they may be summarised as water in its various forms, frost, the wind, and chemical disintegration.

The previous agents had practically left an elevated plateau, limited in extent certainly, but still a plateau, through whose sides and upper surface projected a great series of soft shales, hard gritty sandstones, and coals. To the westward and south of this elevated land lay the low plain of Lancashire and Cheshire.

We need now to consider what is the mode of action of physical agencies to-day, and in what way their action is modifying the older physical features.

The rainfall is the most potent factor which we need to consider. The rainfall of the district is between 40 and 50in. per annum, and thus a large volume of water is discharged annually upon the district and must be got rid of.

Evaporation is slight and percolation inconsiderable. Most of the moors are peat covered, and these latter deposits can readily absorb a large amount of rainfall; but when a waterlogged condition has been reached, which is not unfrequently the case, the whole of the next downpour is thrown into the mountain streams. In the early spring and autumn the greater part of the rain is at once thrown off into the streams, and it has been my experience on more than one occasion to find the surface of the moorland slope for many yards covered with a sheet of running water.

Where grit rocks are exposed on the moors percolation will take place to some extent, as the millstone grit and coal measure rocks are much jointed and often coarse grained. The shales are less permeable to water, but some quantity does certainly travel along the bedding planes.

The water thus lodged in the outermost joints and fissures and bedding planes is subjected in winter to the action of frost, and on becoming converted into ice increases in bulk, and forces the sides asunder or drives off particles and flakes of rock. In this way outstanding masses of rock are gradually destroyed. The loose sand grains and

earthy particles which gradually accumulate at the foot of any outstanding mass of rocks are picked up repeatedly by the wind and driven against the rock front, and by this means the fretting away of the rock face proceeds.

The constant impinging of the wind itself upon projecting angles and particles must also operate in destroying rocks.

The result of these agencies is seen in many places in the North-East Lancashire and Yorkshire moors by great bosses of millstone grit, whose sides are wind fretted and deeply scarred by water and frost. Here and there a rock has wholly disappeared, and a bare patch of coarse sand on the moor marks where it once existed.



Falls at Cliviger.

Destructive action is, however, most potent on the hill flanks, and is wholly due to the abundant stream water acting upon rocks of varying hardness, and to the high velocity acquired by the falling water. It is carving out those deep, narrow ravines, or "cloughs," which run down to the main valley system of the district.

If we consider the whole of North-East Lancashire we find it to be a plateau which is in a region of high precipitation, and descending abruptly upon much lower levels. It follows that all the streams will have a high velocity, and a considerable carrying power and destructive action. Before, however, we consider the latter, I wish you to note the general rate of fall in one part of this district, namely, that of Rossendale, which I have taken as an example of the whole.

This area is drained by the River Irwell and its feeders. The primary feeder is Irwell Springs, which arises at an altitude of 1,350ft. just under Thievey Pike, 1,450ft. high. The valley terminates at Bacup at an altitude of 850ft. It is approximately north and south, and has a fall of 500ft. in about two-and-a-half miles, or 200ft. per mile.

At Bacup it is joined by another feeder arising on the north slope of Tooter Hill, at an altitude of 1,300ft. The rate of fall is approximately 450ft. in one-and-a-half miles, or 300ft. per mile. The main valley of the Irwell commences at Bacup, and runs almost due east and west to below Rawtenstall, where it bends sharply to the south. Its third important feeder is the Whitewell Brook, which arises by the union of a number of small streams from Dean Heights (1,300ft.) It joins the main river at an altitude of 625ft., a fall of nearly 700ft. in about four miles, or 175ft. per mile.

A fourth feeder is the Limy water draining the Crawshawbooth valley. It arises on Hameldon Hill, at an elevation of nearly 1,300ft., and joins the Irwell at Rawtenstall at 548ft., a fall of over 750ft. in five miles or 150ft. per mile.

From Bacup to Rawtenstall, the river falls from 800ft. to 548ft. in a distance of four miles, a fall of 252ft., or 63ft. per mile.

It will be instructive now if we note the rate of fall of the valley sides. If we take the Irwell Springs valley at about a mile-and-a-half from its source, we find the valley sides have a fall of 350ft. in half-a-mile on either side, or 700ft. per mile. The hills which shut in the town of Bacup are no less steep. The Bankside hill has a fall of 400ft. in less than half-a-mile, or 800ft. per mile.

On the east side the fall from Hogshead Low (1,453) to Bacup is 603ft. in a straight line of one-and-a-half miles or 400ft. per mile.

In the Whitewell Bottom and water valley the fall is 275ft. in two-thirds of a mile (Liver Hill to Water), or 350ft. per mile. From Newchurch to Sagarholme, the valley is very steep on its western side, the fall being about 300ft. in 300 yards.

The fall on the west side of the Crawshawbooth Valley at Goodshaw Fold is 800ft. per mile. On the east side it is 425ft. in a mile. You will notice one remarkable fact for which I cannot account, viz., that the western slopes are always much more steep than the eastern ones.

Similarly the southern slope of the east and west main valley is much more steep than the northern. The slopes of the main valley have a rate of fall quite equal to any of its branches. The fall for instance at Stacksteads is 450ft. per mile on the north side, and 700ft. per mile on the south side. At Clough Fold it is nearly 500ft. in a mile on the north side, and 840ft. in a mile on the south side.

The fall from Coupe Lenche to Rawtenstall is 760ft. per mile. The occurrence of a narrow gorge near Waterfoot, through which all the water from the Bacup and Stacksteads Valley passes, would indicate that at one time the water was held back at this point into a lake. The highest limit of this lake was not over the 775ft. contour line. At this level it was nearly two miles long, nearly half a mile broad, and over 120ft. deep.

We pass on now to study the action of stream water in North-East Lancashire at the present day.

A river course may be divided into three portions—(1) the mountain or torrential track, (2) the valley track, and (3) the plain track. The first is the chief feature in North-East Lancashire; the valley track is insignificant; and the plain track, where a stream wanders in all sorts of windings at a sluggish rate, is wholly absent.

Let us take any one of the mountain streams, and follow them in their course downwards, note their growth and their mode of action, and then we shall know why and how the minor features of North-East Lancashire, *i.e.*, the cloughs, have arisen.

Originating as trickling rivulets of water from the extensive peat deposits of the moorlands, the mountain streams rapidly increase as they pass to the lower levels, and eventually acquire a volume and velocity which enables them to cut into the rocks over which they flow.

If these are shales, as they very often are, then the excavatory work proceeds at a very rapid rate indeed, and a narrow and occasionally tortuous channel is formed, with sides which are almost vertical. In many of the upper parts of the cloughs the sides are nearly vertical, and only furnish lodgment for a few hardy ferns and grasses.

When the stream passes from shale to sandstone, or when it reaches the sandstone after cutting through the shale, its mode of destruction is changed. The hard sandstone weathers but slowly, and often very irregularly. Being often of varying hardness, pockets of the softer material are usually picked out, and rock pools formed, in which the water swirls round at a rapid rate.

The course from one rock pool to another is often exceedingly narrow and twisted, and sunk below the general level of the bed of the stream. In addition to these features the rock is cut away in small ledges, which succeed each other for some distance down the clough. The rock pools are upon the various ledges, and their connecting narrow channels cut through the outer lip. During heavy rains the streams cover the whole of each ledge, and the pools become partially filled with rocky débris.

When the water passes from the sandstone to the shale, the latter, by reason of its softer character, is cut away more quickly, and soon there arises a perceptible drop in the level of the stream at the point where it passes from one rock to the other. This difference in the level is increased by the continued destruction of the shale, until a well-defined waterfall results. Once the waterfall is formed, it begins to recede up the clough by the shale which underlies the sandstone becoming picked out by the water of the pool formed below the fall, and by spray being continually driven against it. The ledge of rock over which the water is projected by and by ceases to be supported underneath, and water finds its way down the joints and fissures which exist a little way back from the edge, and finally, often during flood time, the lip of the waterfall is carried down into the pool below, and afterwards thrown out upon the sides in a great heap of wreckage. These waterfalls are common in all cloughs, and add considerably to their beauty. Where the rock is massively bedded and well jointed, the fall is broken up into irregular steps formed of the various bedding planes, and the water leaps from step to step, forming miniature cascades all the way. Where the

sandstone is passing into a shale, or where the rock of the fall consists of bands of shale and grit, the face is usually a sloping one, and the water rushes down the whole length of the face like broken water over a weir.

In a few cases a thick bed of massive grit reposes upon fairly tough shale, and where this occurs, as in Greens Clough, near Portsmouth, the water drops clear from a projecting ledge of sandstone into a pool thirty or forty feet below. The ledge of rock in this particular case was originally several feet thick, but has been scooped out by the water, and the stony *débris* constantly carried over the fall, until it now forms a trough whose cross section would be almost half a circle.

The increased volume of the stream, due to lateral feeders, results in the clough becoming widened out, and as the sides are thus better exposed to the action of storms of wind and rain, and frosts, they are destroyed more rapidly, and the cliff-like character may be lost in steeply sloping sides.

From time to time, during heavy floods, the streams deposit a greater load of *débris* at various points along their track than they are able to afterwards move, and the waters become deflected to one side or the other, and commence to eat out the scree slopes. This results eventually in a low alluvial flat being formed on one side of the stream, and in a vertical or even undercut cliff on that side against which the streams are projected. In this way a clough is sometimes seen to suddenly widen out into a sort of sylvan amphitheatre, the bottom of which is filled with a level tract of bog or meadow land covered with ferns and trees, and bounded by the stream, which margins on the opposite side a tall cliff, festooned with trailing ivy, honeysuckle, ferns, and flowering plants.

A strongly marked feature of all cloughs is the vast quantity of rock *débris* which strews their whole course. From waterfall to waterfall, the stream courses are so full of *débris* that the water is often lost among the stones, and it is only in flood time that anything approaching a continuous line of water can be seen. Careful search on the sides of cloughs, particularly along the lower levels, often reveals lines of rock *débris* at heights above the reach of the present day flood water. In some cases a sudden violent flood has resulted in a loop of the stream having been cut off by a straight channel being dug across the level meadow of alluvial matter, and the old stream course of the loop is left dry and filled with stones, or serves as a relief to the new channel during the floods. In the large and older cloughs, there is often abundant evidence to show that the waterfalls have been cut back for considerable distances, the rocky ledges which formed the falls standing out along the two sides of the clough as a line of cliffs.

My own observations lead me to the conclusion that cloughs such as I have described represent the maximum effort of river water in a carboniferous country. They are one of the most distinctive physical features of North-East Lancashire, and are true representatives of that "torrential track" with which most rivers of any size and importance first commence.

CAPTAIN COOK'S VOYAGES, 1772-1780.

LOGS IN THREE OCEANS—ATLANTIC, INDIAN, PACIFIC.

SUMMARIES OF OCEAN RAINFALL.

THE logs appended to Captain Cook's two voyages to the Pacific Ocean in 1772 to 1780 give a very good *register of the weather*, with observations by barometer and the thermometer, in H.M.S. Resolution, Adventure, and Discovery.

These logs have been looked through for observations of the *rainfall* over the ocean traversed, and were found very complete in their registrations, and some tables are here given of the ocean rainfalls in the Atlantic, Indian, and Pacific, but by days only.

There does not appear to have been published any logs of the first voyage in the Endeavour with weather observations, which seems somewhat curious, as Mr. Banks and Dr. Solander accompanied it as naturalists, and kept journals themselves.

The Wet days have been classed in belts of every 10° from the Equator, North and South, so as to discover the rates per annum in each 10° belt, by comparing them with the total days passed through in each 10° of latitude.

It would appear that the greatest number of wet days in the Northern latitudes was in the temperate belt of the 40° , 195 days per annum; and the least in the Equatorial region, $0^{\circ}19'$, 116 days per annum.

In the Southern latitudes the greatest number of wet days in the South Tropic belt of the 20° , or 97 days per annum; and the least in the temperate belt of the 50° , or 65 days per annum.

The total rates per annum for the Northern latitudes amounted to 163 wet days, and for the Southern latitudes 81 wet days, showing that there were twice as many wet days North of the Equator than those South of the Equator.

It further appeared that there was no indication of an Equatorial rain-belt in the American Pacific as there is in the Atlantic Ocean, and that the term Pacific would be only applicable to the Southern and not to the Northern portion, which seemed to be as stormy as the North Atlantic Ocean.

The S.E. trade winds appear to sweep up the aqueous vapour from the Southern latitudes, and hand it over to the Northern latitudes, to be there condensed in storms, cyclones, and cold weather.

The Wet days were also distributed according to *months* in tables, and the rate per mensem is calculated for each month by comparing them with the total log voyages for each month of the two voyages.

In the Northern latitudes the highest rate of wet days per meusem was found for January 20 days and April 20 days, corresponding to our winter and spring months ; and the least rates were for December 5 days and January 9 days.

In the Southern latitudes the highest rate of wet days per annum was found for April 12 days and August 8 days, corresponding to their autumn and winter ; and the least for May 0 days and December 2 days, corresponding to winter and summer respectively.

The rates per annum of wet days were found to be for the year 165 wet days North and 75 wet days South of the Equator, showing the greatest amounts of rain deposited North of the Equator, because the supplies come from the South.

This transference of the aqueous vapour from North to South of the Equator may be assumed to favour Maury's idea of the crossing of the winds in the Pacific Ocean as in the other oceans in that belt.

It may make its passage North by taking the N.E. trades on their flank and doubling round by N. Guinea and Japan to Behring seas, and precipitating itself in the typhoons and monsoons of those regions.

Captain Cook's Voyages. Ocean Rainfall, Zones, Three Oceans—Atlantic, Indian, and Pacific. 1772-1780, H.M.S. Resolution.

Zones.	Degrees Latitude.	Total Wet Days.	Total Days, Voyages.	Rate per annum.	Wet Days per annum.
North Arctic	60°	47	99		172
Temperate	50°	42	105		146
Temperate	40°	31	58		195
Tropic Extra	30°	22	49		164
Tropic	20°	25	51		180
Equatorial	0·19°	14	44		116
North Total	—	181	406	N. means per annum.	163
Equatorial	0·19°	34	148		77
Tropic	20°	28	105		97
Tropic Extra	30°	20	93		78
Temperate	40°	36	164		74
Temperate	50°	38	212		65
South Arctic	60°	24	90		96
South Total	—	180	812	S. means per annum.	81
North & South Total...	—	361	1218		244

*N. and S. Pacific, S. Indian, and S. Atlantic Oceans. Monthly Summary of Rainfall. Captain Cook's Voyages, 1772-1780.
H.M.S. Resolution.*

	Rain.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	
NORTH	Wet days per moon ...	20	9	12	20	17	9	10	15	13	16	16	5		NORTH.
	Total days...	19	28	47	32	14	37	58	55	23	29	56	6	404	Rain 165 days per annum.
	Wet days ...	12	9	19	21	8	11	19	27	10	15	31	1	183	
EQUATOR.															EQUATOR.
	Wet days ...	29	35	34	18	0	4	14	7	2	4	2	26	175	Rain 75 days per annum.
	Total days..	164	141	149	47	0	44	60	27	13	37	27	140	852	
SOUTH.....	Wet days per moon ...	5	7	7	12	0	3	7	8	4	3	2	6		SOUTH.
Total ...	Wet days ...	41	41	53	39	8	15	33	34	12	19	33	27	358	
Totals ...	Days' Voyages ...	183	172	196	79	14	81	118	82	36	66	83	146	1256	

W. G. BLACK, F.R.M.S.

* * The registers of the ships are not continuous from start to finish, as there are breaks, at beginning and ending, and of course in harbours: but at sea itself the logs are well kept. I am going through Captain Perouse's voyages and tabling his logs for rainfall for 1785-88, &c., over like tracks as Cook.

**MR. J. P. THOMSON, F.R.S.G.S., ETC., ON SIR W. MACGREGOR'S
JOURNEY IN NEW GUINEA.**

(Communicated by Mr. J. P. THOMSON, November 7th, 1896.)

A SPECIAL general meeting of the Royal Geographical Society of Australasia, Queensland Branch, was held at the Society's Rooms last week, to consider an important telegram from his Excellency Sir William MacGregor, Lieutenant-Governor of New Guinea, forwarded to the President by the Premier, relative to his journey across New Guinea from the mouth of the Mambare River to the mouth of the Vanapa.

The President, Mr. J. P. Thomson, read the following "Notes on Sir William MacGregor's Recent Remarkable Journey across New Guinea and Re-ascent of Mount Victoria":—By the courtesy of the Prime Minister I have been favoured with a copy of the following telegram received a few days ago by his Excellency the Governor of Queensland from Sir William MacGregor, giving a brief account of the results of Sir William's recent remarkable journey across New Guinea from north-east to south:—

"Without loss of life or limb have crossed New Guinea from mouth of Mambare to mouth of Vanapa. Followed Mambare to foot of Mount Scratchley, where river divides to embrace the mountain. Ascended Mount Scratchley, on top of which observed with small theodolite. Found easy road west of Stanley Range; without descending re-ascended Mount Victoria to observe, but weather unfavourable. Descended Mount Knutsford, and found a not difficult road to coast. The miners have been at work at foot of Scratchley, probably the whole of which is auriferous. Wharton Chain connects Mount Scratchley with the great Mount Albert Edward, which is also well inside British territory. All these great mountains seem composed of slate and quartz. No natives between Government station and Mount Scratchley. On the latter is very friendly tribe. Excellent relations with natives from Mount Knutsford to the coast. Had scarcely a single completely dry day. I strongly dissuade any travelling towards the interior before April or May. Native carriers will not be permitted to proceed inland with Government sanction before then, when all possible facilities will be given to prospectors during the dry season.

"Signed, WILLIAM MACGREGOR."

In view of the important bearing of this successful undertaking upon the opening up and probable future of the possession, I thought it might be of some interest to offer a few remarks on the geographical condition of the country between the Mambare and Vanapa rivers, along the overland trade route, now discovered and about to be opened up by my distinguished colleague, the Lieutenant-Governor. It is well known that in 1889 Sir William MacGregor, who at that time had but very limited resources at his command, successfully accomplished the ascent of the Owen Stanley Range to its highest summit, which he named Mount Victoria. In the course of my official duties, the work of compiling the map illustrating the explorer's route on that occasion devolved upon myself, and I am consequently morally responsible for the correct delineation of all the features upon it, although this does not appear on the face of the map itself. At the time I had the privilege of being the first to deal with, examine, and make public the geographical results of that famous journey, in a paper read, in Sir William MacGregor's presence, at a meeting of the Royal Geographical Society of Australasia, Brisbane, on September 2nd, 1889. I mention this to show that I possess an intimate knowledge of every detail connected with the work

and results of the expedition in question, and am fully prepared to enter into all the particulars of it, even more fully than I have done on a previous occasion, or in my work on "British New Guinea." It is necessary for me to make this observation in view of the persistent statements concerning the expedition by one of Sir William MacGregor's predecessors in the field of exploration.

For many years before the arrival of Sir William MacGregor in New Guinea, several attempts had been made to explore the alpine region of the Owen Stanley Range. For various reasons no one had been able to accomplish it. These attempts by Captain Armit, Messrs. Chalmers, Goldie, Morrison, Hartman, Hunter, Cuthbertson, and Forbes resulted in signal failure, neither of the explorers reaching even the foot of the great range. In a letter published in the proceedings of the Royal Geographical Society, London, September, 1890, Mr. H. O. Forbes stated that his "nearest approach to Mount Victoria, by my own maps, is between eight and nine miles," and that it was only necessary for him to descend to and cross the Warume River below him to obtain access to several leading spurs leading directly to the summit of Mount Victoria. He believed that the road traced by his eye from the hills in the Sogeri region on his first arrival in New Guinea was more eminently feasible than the one followed by Sir William MacGregor in the latter's journey to the summit of Mount Victoria. Against this statement it may be pointed out that there seems no doubt whatever that Mr. Forbes did not see the highest crest of the mountain from his nearest approach to it, and it is almost certain that he could not have obtained access to the crown of Mount Victoria along the south-easterly spur of it. Concerning this accessible spur which Mr. Forbes purposed ascending, Sir W. MacGregor says it is a mighty, precipitous buttress, exceeding 12,000 feet in height, "bristling with peaks and pinnacle-like rocks, and contains hundreds of inaccessible crags and precipices."

Sir W. MacGregor's route lay for some distance up and along the Vanapa River, and, apparently, he has followed his old track very closely from the crown of the Owen Stanley Range to the south coast in his recent journey across New Guinea. The important bearing which the successful accomplishment of this remarkable journey must necessarily have upon the development of the country will be fully apparent to all who have watched the progress of British enterprise in the possession since its establishment some ten years ago. Apart from the increase to our knowledge of the geographical conditions of the interior of the south-eastern portion of the island itself—an increase that cannot fail to be of the very greatest interest and importance—the advantage of having a practicable trade route across the British territory is one that can scarcely be over-estimated. It is almost impossible to give an accurate forecast of its bearing upon the opening up and settlement of the country and development of its mineral resources. That valuable minerals occur in the high ranges of the interior has been clearly enough shown by the alluvial gold obtained in the upper reaches of the Mambare River, and the auriferous character of Mount Scratchley, to which special mention is made in Sir W. MacGregor's telegraphic message to the Governor of Queensland. There is little doubt, too, that mineral deposits will also be found on the southern slopes, or near the base of the Owen Stanley Range, and this region will soon be rendered accessible along the overland trade route, passing the western spurs of the range in question.

The Mambare River (the Clyde of the Admiralty charts) debouches into Traitor's Bay on the north-east coast of the possession. The mouth of this interesting river is only about two miles inside the Anglo-German boundary, on the 8th parallel. It is navigable for an ordinary-sized steam launch for about forty miles up, and on the lower reaches are extensive areas of good alluvial land interspersed with remarkably fine fields of sago palms. The district is famous for its very lofty forest trees and fine climate. The river was explored for the first time by Sir W. MacGregor in 1894, and recently he again ascended it on his journey across the island. There is no doubt but that it affords easy access to the mineral areas of the interior, and especially to the bracing highland zones of the Owen Stanley Range, Mount Albert Edward, Mount Scratchley, and other neighbouring ranges, that were hitherto

regarded as inaccessible. It forms an easy section of the great overland trade route now discovered and for the first time opened up by the Lieutenant-Governor, and it is almost certain that the Mambare district will ere long become one of the most important in British New Guinea.

Excellent relations have been established with the natives of the interior, and, indeed, all along the overland route the natives met with have been very friendly, a prevailing condition that will have an important bearing upon the future development of the country by British enterprise.

Not the least important geographical result of Sir W. MacGregor's recent journey is the discovery of a connecting chain between Mount Albert Edward and Mount Scratchley, and the practicability of ascending the Owen Stanley Range to its highest summit on Mount Victoria from the north-east as well as from the opposite side.

At the conclusion of the lecture, which was illustrated by a large map and charts provided by Mr. Thomson himself, Captain Owen, Major Boyd, and Mr. Lethem entered upon a lively discussion. Major Boyd contrasted the physical conditions of New Guinea with those of Western Australia, and showed what great advantages the prospectors in New Guinea had over those of Western Australia, especially in the matter of food and water.

CAPE RIVERS AND HARBOURS.

Extracts from a letter from British Officer, British Caffraria, July 3rd, 1854.

[Communicated by Mr. W. J. BLACK, S.M., F.R.C.S.E., Edinburgh, and read to the Society, Wednesday, May 6th, 1896.]

HARBOURS here also appear to invite attention, but notwithstanding the puffing, I am no great believer in the feasibility of Cape harbours, judging from what I have seen of the south coast at a few points along it. By way of a parenthesis, though perhaps it may not be interesting to you, I will just shortly state my opinion on the matter of harbours at the Cape.

All the rivers along this coast descend very rapidly to the sea; they have short courses, owing to the elevation of their sources in the interior. This may be seen by reference to a map, when I state the Koonap River, four miles from Fort Retief, is about 3,000 feet above the sea, and the Keiskamma River at Fort Cox is also about 1,000 feet above the sea level. A body of water has not time to collect a slow full stream on this account, so as gradually to drain the country along its course. A heavy rain, or considerable wet weather, from the up and down character of the country, soon washes off the open veldt into the rivers. A great freshet takes place, but this is soon disposed of, and the river soon subsides to a brook ere another rainfall comes, which otherwise it would have helped to keep up a continuous slow full stream of water. This refers to the shorter rivers arising from the great Winterberg range, and such as are continuous with it, right and left, or east and west, and by the Amatolas and Sneeuwbergen. But with respect to the Fish River, and some such as the Kei River, arising further inland from the Karroo country, the rains filling them are not so frequent, but are heavy when they do occur. The quantity of water therefore in them fluctuates amazingly, from absolute stagnation for a month or more at a time, to a massive, mud-laden river of 30 feet deep.

Such are these Cape rivers as they behave in the country away from the south coast. From the swift descent of the course of the rivers their beds may be supposed full of rapids, and so they are; the drifts intervening between the pools are rocky more or less, and there the fall of the descent takes place.

Now, how do these rivers appear about the south coast? You would scarcely know that the coast had mouths of rivers opening through it at all, if you were to look at it from the sea. You may ride along the coast too for miles, and cross what are the rivers—only little streams of water running through the sand from large inland pools, enclosed by high wooded banks, rocky or not, according to circumstances. One may ride thus across the Fish River in a dry season, as well as others, as the Keiskamma, that come from a hundred or more miles away inland.

The surf or the tide waves of the coast are always very strong and heavy in calm weather. Your English beach surf is a mere ripple compared to that here under like circumstances. This brings along sand and silt in enormous quantities from the river mouths on to the coast, especially in stormy weather, and the south-easterly winds, which are prevalent here, carry it further up, out of reach of the waters, to form sandhills. During the time of the freshets, loaded as they are there with debris—mineral, vegetable, and animal, large supplies of mud and sand, etc., are added to the sea, which are again carried along the coast by the easterly currents towards Agulhas Banks.

To resist this perpetual system of embanking up the coast rivers, *i.e.* where it is not rocky, it would require a strong, steady volume of water, continuously flowing, to keep open the mouths of the rivers as they ought to be. This is not the case, consequently bars are formed of various sizes; some, as on the Fish River Mouth, are so large as to hold a row of sandhills; these natural dams hold up the river behind, and so a beautiful inland pool is formed, sometimes miles in length, as on the Kowie River, and perfectly navigable up to the next drift, or the ebb and flow drift. Sometimes, however, a big freshet comes down, as in February, 1848, when the Fish River bar was swept away, and its sandhills too, out into the sea, and the tide wave construction was not strong enough to resist it. In poured the sea at the full tide; at the entrance no surf was seen at the site of the bar, and the tide waves ascended the river for miles, and broke gently on the banks on each side.

Now was the time for inland navigation, and it could have been done easily, but gradually the strength of the river current slackened, while the tide wave resumed its empire slowly, and in the course of four months another bar was formed as before. Many circumstances tend to show one that the line of high tide mark has been gradually going out to sea, dependent at present obviously on the perpetual sand-banking system carried on. Old shell banks, and stones water-worn and white, and dry rocks covered with remains of barnacles, limpets, etc., and broken mud banks, dry and water-worn, are among the symptoms of this change of level, which I especially took note of at Waterloo Bay.

Another circumstance assisting in the maintenance of things as they are is the small rise of the tide, not above 4ft. 6in., in ordinary spring tides; thus it gives but little head for any scouring action by hydraulic power. If the tide rose 20ft. or 30ft. what a change it would effect; it would rush up the inland pools at the river mouth, and come down again, like the Fish River freshet of 1848, and sweep away the bar at the mouth. Rivers would then be navigable, and they would also be navigable for certain distances from their mouths, sufficient at any rate for an inland harbour, if the freshets were continuous instead of being intermittent. This probably was the case at the time of the Portuguese navigators in 1498 when they sailed up the river.

Finally, then, it appears to me that no artificial or engineering contrivances, on however gigantic or expensive a scale, can supersede the absolute necessity there appears to exist of increasing the volume of water in the rivers; this is the essential desideratum. If a river is not long enough to have a freshet of any power its mouth becomes blocked up altogether, and a vley or lake is formed, as on the Dent River near Waterloo Bay, which is shut out from the sea by sandhills.

It is perfectly true that these rivers are navigable, most of them, inside the bar, but the pool is no index of the river stream; which is only seen at a drift further up, or in the water running over the bar. If the bar were removed artificially, still there must be something done to correct the disproportion between the strength of the sea and the weakness of the current, which is attempted by training jetties going out from the mouth into deep water, so as to get beyond the surf action.

THE JOURNAL

OF THE

MANCHESTER GEOGRAPHICAL SOCIETY.

THE MANCHESTER SHIP CANAL.

THE STORY IN BRIEF FROM 1708 TO 1896.

(*See Maps.*)

By Mr. W. BURNETT TRACY.

[Addressed to the Society, in the Library, and Revised to Dec., 1896.]

I sing a theme deserving praise, a theme of great renown, sir—
The Ship Canal in Manchester, that rich and thriving town, sir.
I mean to say it once was rich, e'er these bad times came on, sir;
But good times will come back, you know, when these bad times are gone, sir.

* * * * *
Success then unto Manchester, and joking all aside, sir,
Her trade will flourish as before, and be her country's pride, sir.
That is to say, if speculation can but be kept down, sir;
And sure we've had enough of that, at least within this town, sir.

Sung at the Theatre Royal, 1827.

Printed at the Directory Office, 16, Fountain Street, by J. Pigot and Son.

I.

I HAVE always attached considerable historic value to the fact that at the very beginning of Liverpool the importance of Manchester, direct and relative, was recognised.

It may of course be truly said that what is now known as the City of Manchester—the centre of the greatest skilled labour district in the world—owes its existence to the natural water facilities offered by the primitive rivers that drew their abundant and frequently erratic supplies from the fine ranges of hills forming the surrounding country. For it was the point of confluence of the Irk and the Irwell at Hunt's Bank that was marked by the original surveyors, A.D. 620, as the site for the first baronial residence indicating a settlement; and it may be taken as a striking instance of continuity of purpose that the same point now signifies the limit of the Port of Manchester. But what amounts to a particularly solid link in the chain of evidence that a ship route to Manchester was part of her commercial destiny, would sooner or later be absolutely required for the proper fulfilment of things, and was being even

VOL. XII.—Nos. 7-9—JULY TO SEPT., 1896.

then enforced by the early assertion of her manufacturing advantages of climate, coal, minerals and physique, is that the man who was called upon to build the first wet dock in Liverpool in 1708—when the population was 8,000, and there were only 84 ships belonging to the port, and none of them were above 70 tons capacity—became possessed of this idea, and was so far able to impress others with it that four years later he produced a plan headed “A Map of the Rivers Mersey and Irwell from Bank Quay to Manchester. Surveyed by the order of the Gentlemen at Manchester, by Thos. Steers, 1712.” To this was appended a note, halting in expression here and there, but clear enough as to the main points of assurance, from which the following is taken *verbatim* :—

“The Inland parts of Lancashire and Yorkshire being favoured with great variety of valuable manufactures in Woollen, Linnen, Cotton, etc., and that in very great quantities, has made that Neighbourhood as populous, if not more so (London and Middlesex excepted), as the same extent of any part of Great Britain. The trades of these counties extend considerably through the whole Island as well as abroad, and the consumption of Groceries, Irish Wool, Dying Stuff, and other imported goods consequently very great; but as yet not favoured with the convenience of water carriage, tho’ Providence from the Port of Liverpool up to the most considerable Inland town of Trade in Lancashire, Manchester, has afforded the Best, not yet employed Rivers Mersey and Irwell for that purpose. Those rivers are here described from Bank Key (whither from Liverpool the Navigation at present is used). The conveniences of the Navigation carried thence to Manchester might one time or other be of the greatest importance. . . . The Trade made more easy by an expensive Land Carriage being turned into an easy and cheap water carriage.”

This was 185 years ago. The movement did not take shape at once, but in 1720 an Act was obtained to make and keep the “River Mersey and Irwell navigable, and passable for boats, barges, etc., from Liverpool to a place called Hunt’s Bank in Manchester.” This it was considered “will be beneficial to trade, advantageous to the poor, and convenient for the carriage of coals, stone, timber, wood, wares, and merchandises.” The improvements under this Act greatly benefited the district for a considerable period. By 1829 it had become a favourite route for passengers; the journey was a pleasant one, and being accomplished within seven hours was considered sufficiently expeditious. In 1833 the Navigation paid 40 per cent.

The Bridgewater Canal was opened for traffic in 1776.

In 1824 a scheme for a ship canal from the Dee *viâ* Frodsham, Lymm, and Didsbury, was prepared, and submitted to Parliament in 1825, but vigorously opposed, thrown out on stand-

ing orders, and never revived. In 1838 Sir John Rennie recommended to a committee of Warrington gentlemen the construction of a ship canal, sixteen feet deep, between Liverpool and that place, which he declared could be carried forward to Manchester readily. In 1840 Mr. H. R. Palmer, at that time vice-president of the Institute of Civil Engineers, proposed a ship canal with five locks between Manchester and Liverpool for vessels up to 400 tons. This proposal was embodied in a report made to the Mersey and Irwell Company at their request. Interest in the railway movement ran high at this time, and hopes of cheap carriage with quick transit kept pace. This fortunately prevented any further steps being taken to make a canal which must soon have become inadequate, and probably also a serious hindrance to further development on account of the surroundings it would have attracted.

In the prospectus of the Liverpool and Manchester railway, January, 1825, it was declared that we "must not limit our consideration to the immediate accommodation of the mercantile classes . . . or even the still more important saving to the consumers of coals and of every description of goods conveyed. We must contemplate the important effects upon the commerce of the nation" created by such facilities. "It becomes a question of serious importance whether this country, indebted for so much of her wealth, power, and greatness, to the bold and judicious application of mechanical science, shall now pause in the career of improvement, while it is notorious that other nations will adopt the means of aggrandisement which we reject." This true note resounded, was caught up and carried forward, and that vigorous opening solo and chorus heard later at Didsbury at the house of Mr. Daniel Adamson, June 27th, 1882, was set in the same key. That was a representative gathering—merchants, manufacturers, municipal authorities, prominent citizens, and some penmen, quite sufficient to mould and energise a large purpose. It is said that there were seventy persons present, a number of good omen; that seventy went forth—forming a striking parallel instance in profane history—fired with a new propaganda, framed to some extent, as all are, upon antecedents; and to the full measure of their powers, temperaments, dispositions, and opportunities they announced it and kept it within daily sight and hearing of their fellows, constantly and contagiously testifying their own sincerity. A working committee was formed, and in three months (September 26th) they called a meeting of subscribers to consider two schemes, one tidal, projected by Mr. Hamilton Fulton, C.E., which had been unemotionally reviewed and placed on the minutes of the Chamber of Commerce five years before; the other being Mr. (now Sir) Leader Williams's proposal for a lock canal, which was accepted.

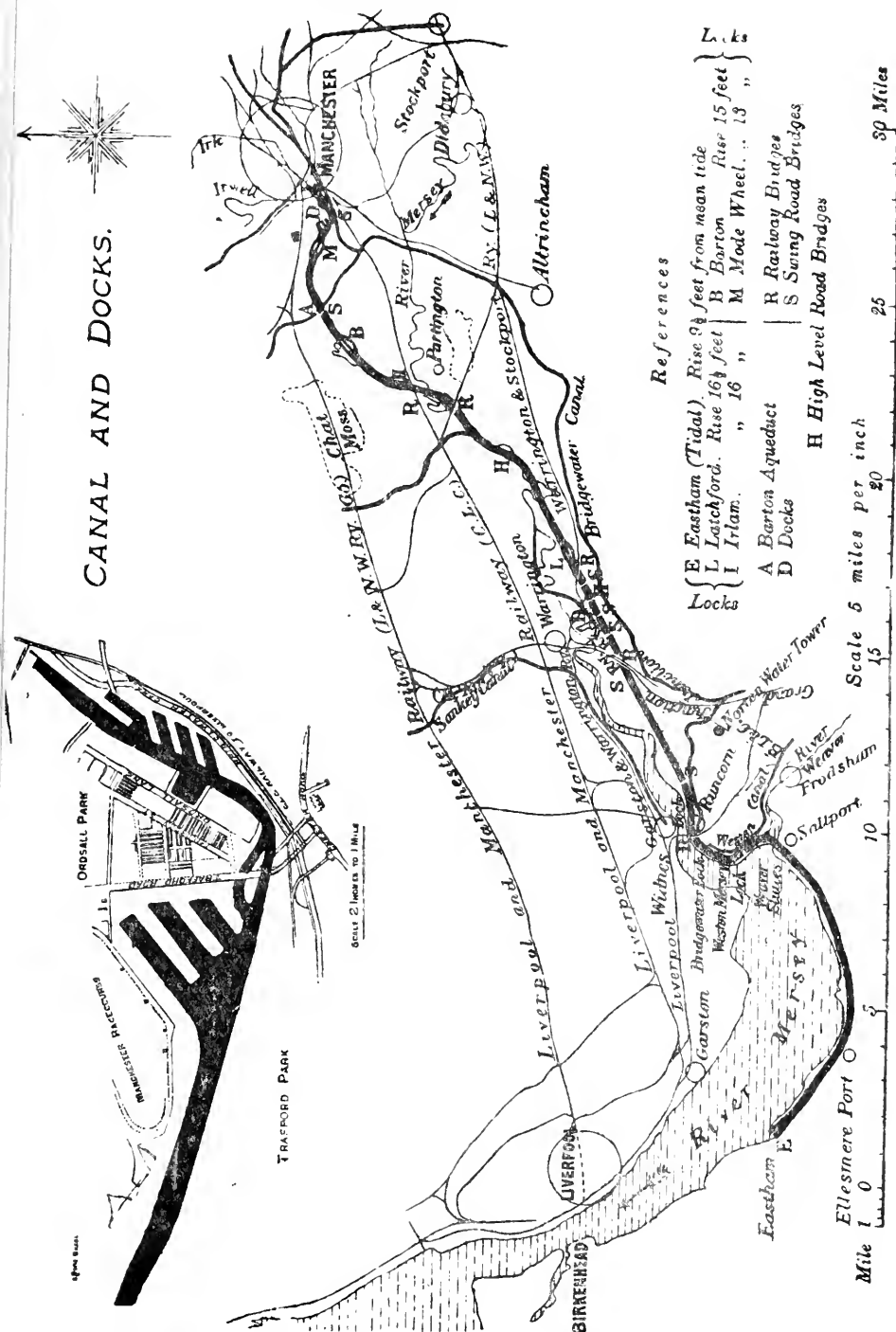
When the Duke of Bridgewater, firmly setting himself to a great work, determined to keep his expenses within £400 a year in order to be able to make the Bridgewater Canal, he gave an earnest of that deep sincerity of conviction and purpose which 130 years later inspired the people of Manchester and of Lancashire generally, when they, aroused by a kindred enthusiasm, became in 1885, after a long deliberative quickening, sufficiently if not fully alive to the meaning and value of the great work with which our city is now identified all over the world. The Manchester Ship Canal is now part of the geography of the district, and its silently growing assumption of definite reality and power is watched with every kind of interest—hope, fear, anxiety, confidence—from every point of vantage and disadvantage, with honest gaze and furtive regard. As it emerged from the shadows of plan and promise into a palpable existence in stone, metal, and concrete, in full possession of all the commanding elements of strength, in presence of the firm tenacity of purpose of all concerned and the successive fulfilments of disputed prophecies, the mists of evil imagination and gloomy prejudice soon began to lift, and have continued gradually to clear before the approach of what many of us believe to be the “rich dawn of an ampler day” for Lancashire, “Trustworthy Lancashire,” as Mr. Pember truly described it in one of his most powerful speeches. When the dawn has broadened into day what will be revealed? is a question that has been well weighed by many who have devoted themselves to this work with the singularity of purpose and superiority to doubt or damp which mark and inspire the pioneer who has matured by well-considered stages. In view of the various treatment it has met with and will continue to receive, until absolute maturity is attained, in common with everything and everybody else of any importance, it may be useful to offer a summary that shall be something more than casual and must be much less than complete, embodying what the Canal is, the general conditions under which it arose and exists, what it has done, and what it can do.

II.

When we consider that the steam diggers and other ingenuities engaged in making this channel for ships represent the best labour of about 120,000 strong men, the tendency to cast any reproach for not commencing the work fifty years ago becomes subdued.

It is often stated, broadly and baldly, that the progress of waterways was seriously hindered and hampered by the exclusive attention given to railways from 1830 forward, and that many of those in existence at that time were crippled and

CANAL AND DOCKS.



endangered by railway influence when they could not be subsidised or purchased outright. But this remarkable concentration of energy upon railways was by no means an unmixed evil; I would rather call it a social process, or a most complete instance of rapid evolution and useful expansion under a unanimous impulse. The almost boundlessly liberal support accorded to railway enterprise at this time provided the impetus and scope needed to arouse and impel mechanical skill and invention to their highest and in every sense largest efforts; and it incidentally nipped in the bud all those tendencies on the part of existing means of transport towards wilful independence and sluggish indifference—eldest born of monopoly—some irritating symptoms of which had already shown themselves in connection with both the Bridgewater Canal and the Mersey and Irwell Navigation. This magnificent expenditure brought the very best men into the line of effort. It secured also a rapid achievement of what was of primary importance, viz., a link connecting markets, a means of quick access for personal investigations and for the prompt interchange of samples of commodities, as well as of ideas. The transport of bulk is a consequence produced by the local genius for creating it and recognising the capacity of material and fitness of place. As the demand for the cheaper transport of heavy and non-perishable material and goods became more imperative, the very liberal terms upon which the railways endeavoured to suppress or minimise canal competition was certain to attract attention in due time. So we need not grumble about delays, nor wonder that a brief interval of doubt or even scepticism preceded faith in the abiding importance of transport by water, especially when we call to mind that the building of railways has led to the making of most of those powerful implements of engineering strategy that are now essential to the economic construction of all great works.

III.

It is natural to feel that the briefest summary of the main incidents of the construction of the Manchester Ship Canal demands something on a higher grade than mere general description *à la* catalogue, but it is a relief also to realise that the ornate would be utterly out of place, and that a simple and concise rendering of the plain facts of the case has a truly classic ring, that these indeed frequently approach the level of Homeric incident.

What may be referred to in general terms as the Canal's ground plan has required for its fulfilment the purchase of 4,600 acres of land, at a cost of £1,287,205, forming a property six times the area of the City of London, and within a trifle of the extent of the whole City of Liverpool. One thousand acres

have been raised both physically and in value by the addition of spoil taken from the cutting and not needed for other purposes. After allowing for the full requirements of the Canal and all accessories, a valuable surplus of at least 2,500 acres remains to be dealt with by the Company.

The total amount of excavation required for the Canal and docks was 51,603,747 cubic yards (half the quantity required for the Suez Canal), about one-fifth of which was through sandstone rock. A cubic yard of soil averages $1\frac{1}{2}$ tons. The rate of excavation was from $\frac{3}{4}$ to $1\frac{1}{4}$ million yards per month, cleared with the aid of two floating dredgers, three German, four French, 60 English (Ruston and Proctor), and 31 other varieties of the steam navy. Two thousand four hundred yards have been taken out in ten hours by the German excavator, but the average is about 500 less. Both French and German work best in soft material, and are not adapted for rough clearances. The English are good all-round machines, can do an average of 700 yards per day, taking what comes, but in favourable soil can reach 2,000. The average cost of excavation is, by land dredgers $1\frac{1}{2}$ d., by steam navvies 2d., and by grab 3d. per cubic yard; and the cost of the machines ranges from £800 to £2,400 each. These great initial forces have been rendered active by the energy of 192 portable and other engines, and supplemented by the service of 212 steam pumps, 194 steam cranes, 59 pile engines, 200 horses, and 173 locomotives working a rolling stock of 6,300 particularly sturdy wagons (each of seven tons capacity, or $4\frac{1}{2}$ cubic yards), over a macaroni route of 230 miles of railway worming in and out, over and under and alongside everywhere. The cost of the railway was about £630 per mile (single line).

The power directing all this—the service of man—in favourable weather and when everything was in full swing, constituted an army of nearly 17,000 individuals, composed of eight companies officered by picked experts, each responsible for a section of about four miles. These men were grouped into communities at several points, and resided, many of them with their wives and families, in timber built settlements, almost suggestive at the first glance of early times in a new country. Two more strong detachments had charge of the railway deviations works, their responsibilities extending $1\frac{1}{4}$ miles inland on each side of the Canal cutting from the points where the lines cross, which they do at an elevation of 75ft. from water level, a height approached by a simple gradient of 1 in 135. The lines pass over the Canal upon steel viaducts, stretching in spans of 137ft. to 266ft., resting on each side upon piles of masonry that are monumental. There are five of these railway deviations, and they require one double viaduct four lines wide, and three single ones, with the usual up and down permanent way. The

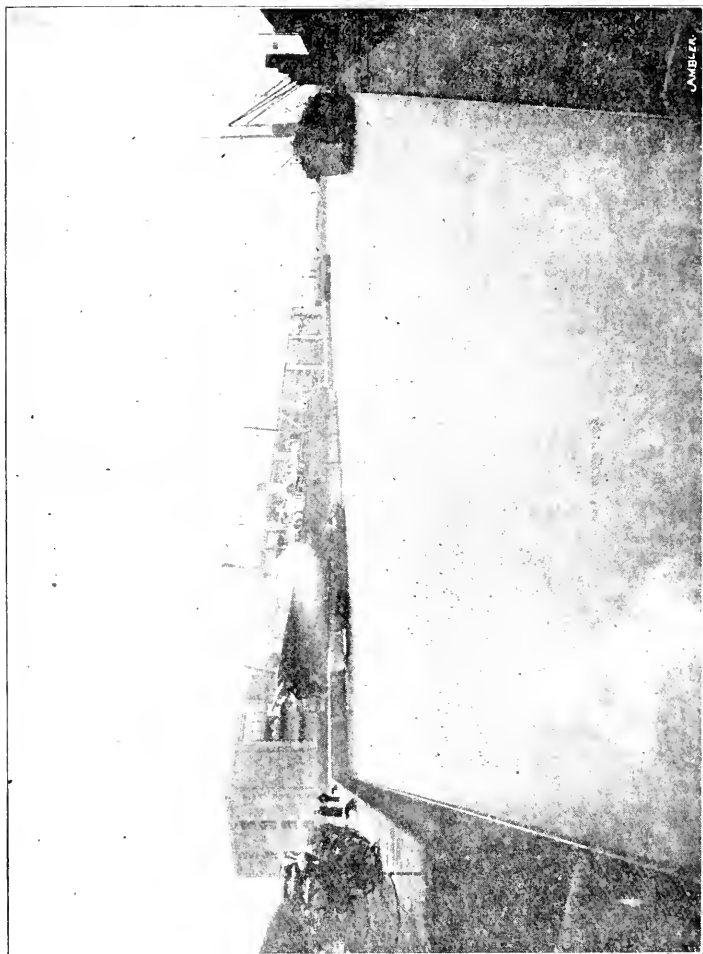
twelve miles of embankment leading to and descending from these bridges have long worn the appearance of having been recognised in a cordial spirit of adoption by, and thoroughly incorporated with, the scenery of the several districts; all marks of newness or disturbance are buried beneath a radiant verdure, as it might be in token of satisfaction at being thus raised from a sleepy and monotonous level to a position of usefulness and trust. In quite a remarkable manner has the formation of the country provided for the useful distribution of the great mass of material that had to be displaced for this big work—embankments to be built and faced, low-lying lands to be raised, and new property created by filling up stretches of river bed where the course was diverted. Equally remarkable were the coincidences in the distribution of rock, clay, and sand, most of the sections being able to provide for a large part of their requirements out of their own spoil.

Seventy millions of bricks have been used, which, piled together, would make 175,000 cubic yards of wall. This is in addition to 220,000 cubic yards of masonry and a million and a quarter cubic yards of concrete. Excellent clay in abundance awaited the diggers, and 460,000 bricks were produced weekly for a long period at what we may be permitted to call the company's model brick-farm or bakery at Thelwall, which was furnished with the latest machinery, and included a series of some acres of covered buildings surrounded by heated walls as a contingent provision against any lapse on the part of the sun. During the busy period 120,000 tons of coal were consumed and 100,000 tons of cement used per annum.

Following on the lines of making bricks without sun, how to make a year into 18 months was revealed by three powerful electric light installations; and 320 of Wells' portable oil lights, each 2,000 candle power, were used or held in readiness for the relief of shadow and the illumination of secret recesses.

The formation of eight miles of massive embankment and sea wall was necessary where the channel runs in the tideway or along the foreshore between Eastham and Runcorn. The foundations alternated between rock and clay, with occasional intervals of sand which had to be made substantial by close pile-driving—a weary process, constantly suggesting hope deferred, at the same time offering a rare chance for engineering skill and persistency. There are 13,000 piles at the base of a critical length of embankment extending about a mile in front of Ellesmere Port. The piles are 13in. to 14in. square and 35ft. long. They were driven on the water-jet principle by means of steam pumps, the water being conveyed at a pressure of 30lb. to the square inch through 2in. rubber pipes down to the pile; these were attached to a 1½in. wrought iron pipe which ran alongside the pile and, distributing the sand, made way for it.

This embankment is faced with stone, and is one of the 41 chief works on the line of the Canal which were so vast and impressive before the water hid three-fourths of their greatness. The sea wall, which in places where the rock is irregular rises from a depth of 40ft., averages 12ft. in thickness, and is faced



No. 6 DOCK, SOUTH VIEW.
Showing Four-storey Warehouses and expanse of water with large Vessels loading.

with heavy masonry hiding a concrete heart as hard as iron. There is a special length of sea wall at Runcorn extending 2,950ft., built in the tideway to separate the Canal from the river, 16ft. wide at the top, rising from a base of 22ft., and faced on both sides by 12in. piles. To compensate this appro-

priation of river course, an equivalent space has been cleared by the company on the Widnes side. The embankments where founded on rock or clay are formed of the latter with heavy stonework protection. They average 30ft. wide at the top, outside slope $1\frac{1}{2}$ to 1, inside from 1 to 2 to 1, according to nature of soil. These banks have now stood the test of years, and have become thoroughly consolidated. Sir Leader Williams, in his presidential address to the Manchester Association of Engineers (January 12th, 1895), said—"They are in as perfect condition as when first made, but stronger, as the clay and earth are now thoroughly consolidated."

The deepest cutting is near Runcorn, and touches 66ft.; but the most imposing, being chiefly through rock, are at Barton and Latchford, the latter averaging 55ft. for a distance of a mile and a half.

The gates for the giant lock at Eastham (600ft. by 80ft.) weigh 300 tons each; the other principal gates are 250 and 200 tons. There are altogether 110 lock gates. They are built of Demerara greenheart wood, which is more durable than iron and renders them less liable to damage if struck. The locks are erected at five points. At Eastham there are three tidal (width of Canal 300ft.); then, after an interval of 21 miles, Latchford two (rise 16ft. 6in., width 290ft.); Irlam two (rise 16ft., width 370ft.); Barton two (rise 15ft., width 330ft.); Mode Wheel two (rise 13ft., width 330ft.). The largest is 600ft. by 80ft.; four are 600ft. by 65ft.; four 350ft. by 45ft.; one 350ft. by 50ft.; and one 150ft. by 30ft. The difference in level between Runcorn and Manchester is $60\frac{1}{2}$ ft.

There are 28 steel sluice gates 30ft. wide, 16ft. deep, with 10ft. rise, and two smaller ones. Also six subsidiary locks, forming side entrances into the Canal—viz., Twenty Steps Lock, connecting the Runcorn and Latchford Canal and the upper reaches of the River Mersey with the Ship Canal; Walton Lock, forming the connection between the Mersey and the Canal for Warrington, and entrance to proposed Dock; Weston Marsh Lock at the Weaver Mouth, being the entrance to the Weaver Navigation; Weston Mersey Lock, entrance for the Weaver Docks from the Estuary; Bridgewater Lock, entrance to Runcorn Docks (147 acres in extent); and Runcorn Old Quay Lock, entrance from the Mersey opposite Widnes.

A sluice gate weighs 50 tons, and the pressure of water is calculated at 100 tons more, yet are they so exactly balanced and controlled by Sir W. G. Armstrong's hydraulic apparatus that one gate can be raised four feet by one man in one minute. Ten of these steel-plated sentinels stand as it were on guard opposite the Weaver Mouth, nominally for the purpose of protecting that river and the estuary from any embarrassment either of ebb or flow. They could pass 50,000 cubic feet of

water per second. Two of these gates would have been an abundant security, but they were a concession to one of the sixty-four almighty vested interests, so many of which have applied their enormous and Parliamentary powers of suction in one way or another to the Canal treasury. They will remain a permanent and splendid monument to Lancashire's determination, and a constant aid to reflection.

Probably the most popular work on the Canal is the Barton Aqueduct, by means of which the Bridgewater Canal is both carried over the Ship Canal and its course stopped and swung round at right angles during the passing of big ships. This takes the place of Brindley's fixed aqueduct over the old river, which held an unbroken record of 125 years. It is 235ft. long, 6ft. deep, 18ft. wide, is worked from a central pier and moves upon a radius of 64 rollers; it covers two spans of 90ft. and weighs when swinging 1,400 tons.

There are two high level cantilever bridges (683 tons) for passenger and general traffic at Latchford and Warburton, and seven swing road bridges from 507 to 1,800 tons. Also two railway viaducts over the Mersey, at Acton Grange (353 tons) and Glazebrook (561 tons), and one over the Irwell at Irlam (426 tons).

The Partington Coal Basin is admirably situated for the important purpose it has to fulfil, and it is sufficiently out of the way of the bustle of general business. This depot brings the great South Yorkshire Coalfield 30 miles nearer the sea, and for the first time gives it a fair chance. The Cheshire Lines are in touch with it, and the Midland Railways intersect this inexhaustible source of supply; Lancashire coal lies close round about, and the Wigan and Haydock fields are only eight miles away against 23 miles from Garston. The foundations are built for six tips; four of these have been working since the Canal opened; they are fitted with hydraulic machinery and every modern appliance for loading. About 160 tons of coal an hour can be delivered from each tip. There is five and a half acres of water space, 20 acres of quay area, half a mile length of quays, and five miles of sidings. The basin forms part of the Canal and the tips are alongside, so that vessels can proceed direct to their positions without any interference with the fairway, and afterwards continue their course without delay of any kind. There are also wharves for mining timber, chemicals, etc., and an excellent alternative is thus offered to St. Helens.

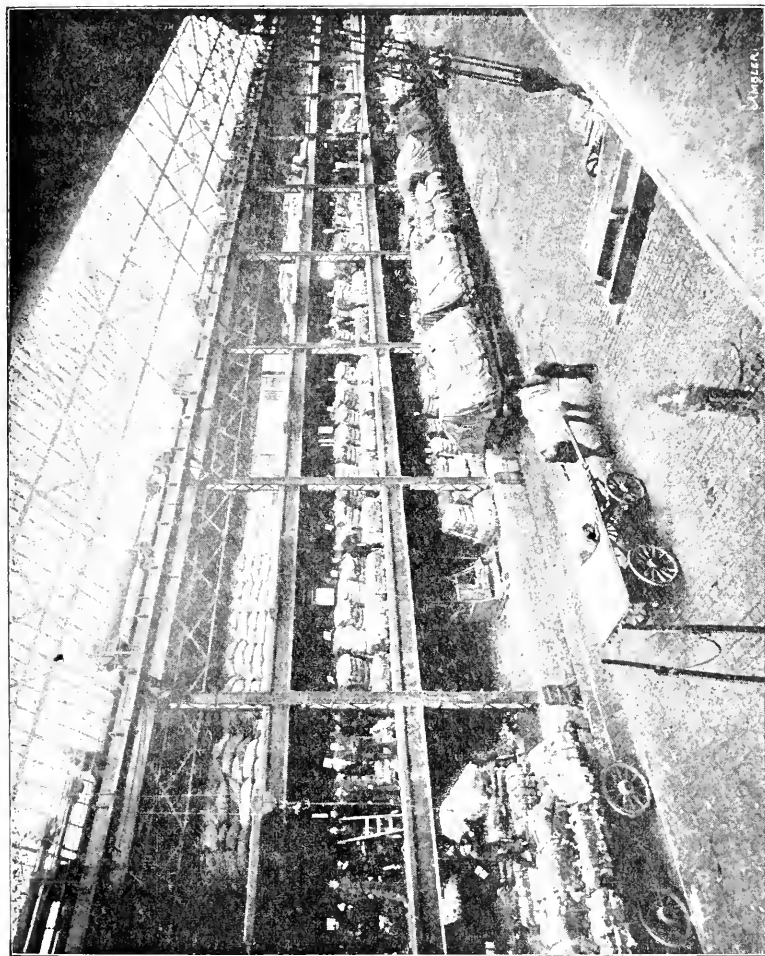
IV.

For the purposes of working the hydraulic machinery in connection with the docks and locks, there are seven and a half miles of pipes laid, which sustain a pressure of 700lbs. to the square inch.

The Manchester Docks and their equipment can only be referred to here in a summary manner. To all who are sincerely interested in the history and purpose of the Ship Canal, and who are constantly noting how that purpose is being fulfilled in many ways as sure and inevitable, if in some cases as slow, as the course of nature, the docks are an unfailing source of inspiration, promise, and hopefulness. Rid yourself for the moment of all personal considerations, and the metallic limit of dividends, and fix your attention upon a supreme effort made by a working district as big as a small nation to break a grinding and increasingly indifferent monopoly, and to let in a new stream of saving vitality. Every one should see the docks, and go about it quietly and thoughtfully. There is no better cure for the distractions of cavil, untruth, passionless criticism or passionate misrepresentation. There you are in the presence of "the beauty and mystery of the ships," you are conscious of the possibility of being in touch with the world without let or hindrance; there is something of "the magic of the sea" in the atmosphere of the place, and everything you look at and touch appears thorough and the best of its kind. All details of administration can at any time be altered and adjusted. The central fact is that the thing is accomplished, the alternative route is established, nature's offer has been accepted.

The Canal is three years old. Many of us can recall the opening day (1st January, 1894), "for traffic" as was said, when amidst the general glow of rejoicing, we could not help looking at the bare quays, the first sheds with unfinished roofs, the unpaved floors, and the primitive roads. But what have we now? While the hare has been prating, if not sleeping, the tortoise has been working diligently. There are 16 one-storey transit sheds, most of them 300ft. by 71ft., 35ft. high to point of roof, 20ft. at the sides; one two-storey fruit shed of the same area; one customs transit shed 150ft. by 40ft.; one London cargo shed 450ft. by 71ft.; six three-storey warehouses in three pairs, connected by girder and glass roofs over a 48ft. roadway. These are served by hydraulic cranes, the jibs of which can deliver goods from the ship direct to the third storey; they are fitted also with hydraulic lifts and jiggers, which can be moved along to any point for the loading of wagon or cart. The area of each floor is 300ft. by 72ft., and the ground floor is wagon height (3ft. 6in.) from quay level. All these buildings stand 36ft. 6in. from the edge of the quay walls, three lines of rails intervening for cranes and railway wagons, so laid, however, that cart traffic can pass over them. There is no interruption anywhere from chains or ropes, as the bollards which are placed at intervals of 75ft., and to which the vessels are moored, are built in with the quay walls, and emerge only at the extreme edge. The subways along which run the hydraulic service and fresh water supply

pipes are built round the docks just behind the coping. They are lined with concrete, measure $5\frac{1}{2}$ ft. by $3\frac{1}{2}$ ft., and extend altogether upwards of four miles. The docks and warehouses are lighted by electricity throughout, and the roadway down the centre of the quays between the sheds is 48ft. wide. All



INTERIOR OF THREE-STOREY SHED.
The work of an ordinary Goods Station is performed at each of these Sheds.

the roads are in good settled working order. The new range of 13 seven-storey warehouses are 65ft. deep, extend from the Salford quay along the entire length of Dock No. 8, and are specially designed for the storage of cotton; and the seven four-storey warehouses on quay No. 6, 72ft. deep, are fully occupied

with grain and general cargo. Altogether the dock premises now include 45 separate buildings, containing 157 depôts. There are 40 steam and 30 hydraulic travelling cranes, lifting from $1\frac{1}{2}$ to 10 tons, with a varying radius of 15ft. to 30ft., and one 30-ton crane, with a 30ft. rake, for raising heavy machinery.

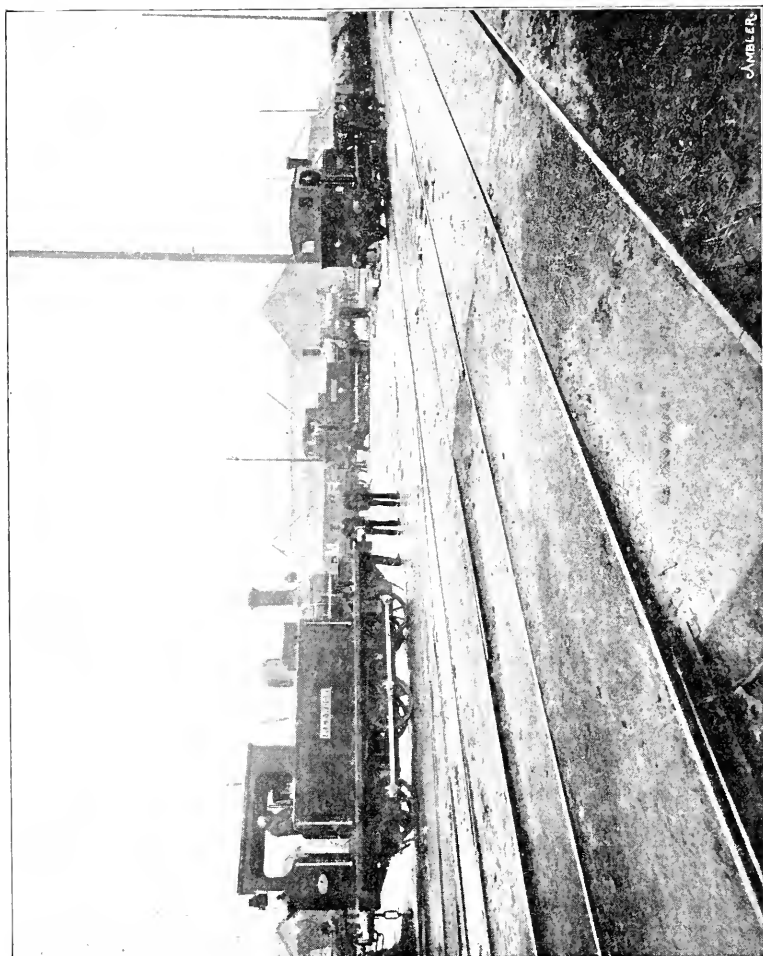
The railways of the company now measure 85 miles 50 chains. They convey traffic between the various loading and discharging berths, and along the Canal, and are connected with all the railway systems of the country. Trains are made up at the docks, and conveyed to the limits of the estate by the Ship Canal Company's locomotives, and then transferred to the railway companies. For some time after the opening there was a languid service of two trains a day, one in and one out; now there are about thirty trains daily, with prompt and willing service. There are now five stations, 300 points and crossings, 21 hydraulic capstans, a railway staff of 482 men, and 35 miles of permanent way about the docks. The gridiron on Salford Quay, where the several lines converge and divert, is a capital point for observation, and a striking and obvious testimony to growth. There are 22 locomotives and 337 wagons, the property of the company, constantly occupied about the docks only. During 1896, 672,000 tons of merchandise, requiring 113,195 wagons, was dealt with at the Manchester docks alone. The total traffic carried over the railways of the company for the year amounted to 844,789 tons, which means a movement of 2,300 loaded wagons per week. In 1894, 450 per week was never exceeded. The 14 canals in communication with the Ship Canal intersect upwards of 750 miles of country.

The timber wharf on the Trafford side of the docks with a frontage of 1,500ft. offers storage accommodation for 50,000 standards, which is equal to about 170 average cargoes. It was found necessary to increase the accommodation after the first season, on the Salford Quay side. During 1896 the total imports of timber reached 180,394 tons, being an increase of 86,584 tons over the previous year.

The dock frontage of Salford Quay from Mode Wheel Locks to the 30-ton crane is 2,200ft. The total area of the docks is 256 acres, giving a waterspace of $104\frac{1}{2}$ acres and a quay area of 152 acres. The total length of the quays is $5\frac{1}{8}$ miles. The best idea of the capacity of the Salford basin is obtained by striking an imaginary line across from the bridge-end of Trafford Wharf to the Salford quay, keeping 230ft. in front of the pier heads; this gives a width of 1,344ft. On the Trafford Wharf there are also a fixed landing stage half-a-mile long, an engine repairing shed, a shed for general use, overhead travelling crane and steam winding engines for timber movement, a permanent road 60ft. wide from the dock offices up to the dry docks yard and the Corporation cattle lairages, a distance of about

a mile, together with railway communication along the same course.

In the principal dock at Salford, three Atlantic liners have been berthed simultaneously at the same quay. The bottom width of the Canal, is, with one brief and temporary exception,



A GLIMPSE OF THE DOCK RAILWAYS.

120ft., and the average surface width is 172ft., for 30 miles. From Barton to Manchester it is increased to 170ft. and 260ft. respectively. The official notice, dated October, 1895, stated that "the Canal has been excavated throughout to a depth of 26ft. which will be maintained by dredging. The large docks have

been excavated to 26ft. and the smaller docks to 20ft.." The water space is considerably increased at all the approaches to the locks and docks and at Runcorn.

The cargo capacity of the Canal has been estimated upon 300 working days a year at nearly 145,000,000 tons. Seventy vessels a day could pass the locks under ordinary conditions, which is more than double the number entering Liverpool at the present time, and it is a little remarkable that the total number that entered the Manchester docks on the 1st January, 1894, was seventy-one.

The water supply, at a time when the rainfall was one-third below the average, was found to be 22,500,000 cubic feet per day. In time of drought the flow is equal to 14,500,000 cubic feet, which would be sufficient to pass 175 vessels varying from 50 tons up to 5,000 tons capacity through the locks daily. The Rivers Mersey and Irwell and their tributaries which comprise the watershed have a total length of nearly 300 miles, and an acreage of 568,703. The normal flow of the Irwell at Throstle Nest (Manchester Docks) is 150,000,000 gallons a day (there are $6\frac{1}{4}$ gallons to the cubic foot), while the storm flow is stated to be from 1,800,000,000 to 4,000,000,000 gallons. Up to the present time the supply of water has been so abundant that it has been necessary to keep the sluices at the locks constantly open. The sanitary condition of the water has been greatly improved since the opening of the Canal. A Joint Committee of the Lancashire and Cheshire County Councils has been at work for several years, armed with full Parliamentary powers to prevent the pollution of the rivers and streams; the sources of pollution have been exposed and grappled, but with considerable judgment and forbearance, and fully seven-eighths have now either in work or under construction sanitary processes which must be made efficient within a limited time under severe penalties. Public opinion is thoroughly roused, and the iniquity of river destruction is universally recognised. This view is also now backed by the unfailing force of self-interest, as, in addition to the fact that the Canal is daily proving itself a very direct benefit to Lancashire industries, it has also been shown and proved that many of the waste matters that caused the pollution can be utilised and made to pay much more than the cost of their transformation.

The reports of the Joint Committee show that they have been met generally in a loyal manner by the manufacturers whose works have caused the trouble, and that the offences are being rapidly reduced to questions of drainage, resting to a large extent with municipal and other local authorities. Great progress is being made in this direction also. The City of Manchester is working out a system of dealing with one-half of its sewage—amounting to 12,500,000 gallons daily—and before

long, it is declared, the whole 25,000,000 will be under proper treatment. The Borough of Salford has been experimenting for some time upon the best means of dealing with its sewage, which amounts to 10,000,000 gallons daily; and those districts that have continued to neglect their public duty in the matter are now placed under a pressure the result of which is certain, and without much further delay.

Although the water in the Canal and docks is dark in colour, except in close weather it is almost free from bad odour. It is admittedly much better at its worst than the Clyde at Glasgow or the Liffey at Dublin, and it is a very great advance upon what the rivers were before the Canal was made. There has been much affectation, as well as absolute falsehood, about what has been written and said upon this as upon many other points. The central absurdity is that any one should for a moment attempt to connect the question of the wilful pollution of water-courses (which takes place in many other places besides Lancashire) with the mission and success of the Ship Canal, which are respectively clear and ultimately certain; and a chief source of satisfaction is that the Canal is going to prove the salvation of our rivers as well as of the industries along their banks.

V.

Such is the Canal, as it came about and now exists; sketched in outline much too thin in places, but sufficient for a general indication. In dealing with a large subject, that personal interest as well as public duty has led one to observe and examine in all its bearings and circumstances of light and shade for many years, including the whole period of its actual growth, one approaches and proceeds with the task of summarising and being concise under a constant sense of restraint, which may occasionally cause a drifting towards a too bare enumeration. The task does not get easier as we proceed to the second division of our subject—the conditions under which its construction took hold of the people and was determined upon.

Doubt, query, and gloomy prediction are met with in almost every important connection in this world, but fortunately belief, confidence, and high purpose co-exist and counterbalance. When canals were first beginning to attract attention a cry was raised that they should be kept four miles clear of all towns of any size, lest the packmen should be handicapped.

When the first railway was under discussion Lord Eldon expressed his regret that the intelligent people of the North had gone mad on such wild schemes; and another noble authority declared it was all very well to spend money—a process which, on the whole, he believed in, because it must do

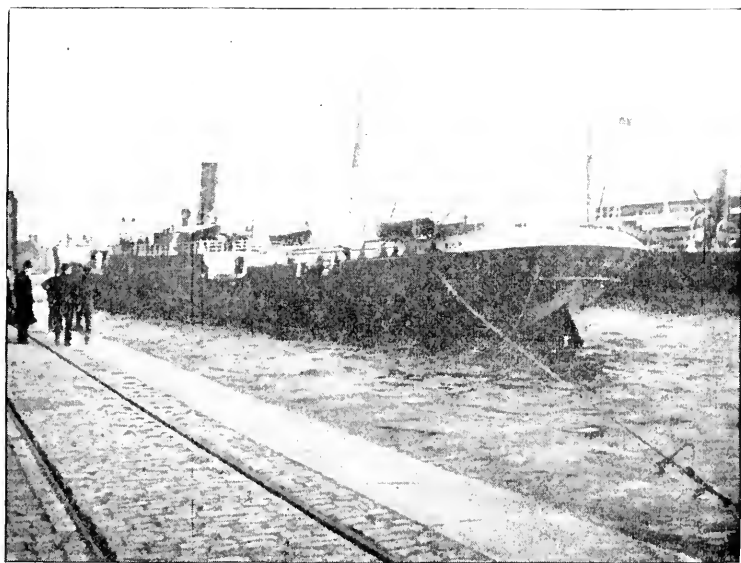
somebody good—but he would eat all the coals that would be carried by railways. Fifty years later, in 1874, 127,000,000 tons were so carried, but the noble seer was fortunately dead.

There was also a solemn and pathetic protest entered against railways because they would give horses the go-by, quality would decline and breeders cease.

The Manchester Ship Canal in all the early forms of suggestion and projection indicated clear and broad commercial vision. The rapid accumulation of wealth had to some extent blunted the sensibilities and narrowed the range of observation, yet from the first comparatively small waves of depression up to the stronger and increasingly ominous ones, that ultimately caused the determination to make the Canal to become and remain so fixed, attention was always turned with growing seriousness and approval to the natural facilities and economies held out by water carriage. But quick recovery from these early variations of trade led to forgetfulness, and the expense became an increasing barrier as the necessity increased. Thus matters were allowed to drift until the work was ultimately undertaken in sheer defence of commercial life. I will take the liberty to quote from an early paper of my own instead of rewriting the passage, because it was written at an important time and under a brisk fire of enthusiasm: "There were two unrelenting tolls standing between the manufacturer and the raw material, one for touching the land and another for crossing it. With increasing prosperity a heavier share of the profits was demanded in this form, because the consumer had no option. The growth of foreign competition, chiefly in places where water transport has been regarded and proved as a chief factor, at length brought home to the skilled workers of Lancashire, Cheshire, and Yorkshire that their excellence could not prevail against more economical conditions. Out of this arose the determination to bring a waterway to Manchester, so that the landing tolls might be reaped in the district served, and thirty miles of expensive railway carriage avoided. One hundred and seventy-seven neighbouring towns are represented on the Manchester Exchange, and are benefited more or less by the Canal. Eleven of these have more than 100,000 inhabitants, and 151 of them justify their existence by skilled handicraft. Manchester is the nearest port for about 7,500,000 people, the working portion of which multitude produce manufactured goods that are approved and wanted—on level terms—almost everywhere. These people all require food and clothing, they send 2,000 buyers every week to the Manchester Produce Exchange, and 2,000,000 of them reside within carting distance of the docks. The canal scheme is the joint product of all these centres of energy and industrial life. They know its purpose, possibilities, and promise. They know it is neither a fad nor

an experiment, but a long-delayed development of natural resources, and they know that the bitter and clinging hostility it provoked was its greatest testimony."

Lancashire's effort was the climax of a historical development. Her climate, physique, and natural supplies, already alluded to, had long ago determined what she was best and conspicuously adapted for. She was fully equipped with men and machinery up to date, and if she could bring her transport facilities up to the same level of equality, her native industries would be revived and strengthened, and new diversions encouraged. It was far above any small sentiments of spite or opposition, although there had been a long period of vital drainage.



BERTHING A VESSEL IN MANCHESTER DOCKS.

It was the ultimate accession of strength sufficient to provide a clear course for herself and her own, after hard training. She was at the same time conscious that as to the past under similar conditions she might have done as she had been done by. There must be no crying over spilt milk, but the supreme effort must be made to break down all artificial hindrances, all filtrations and subtraction of revenue, and remove every possible tax upon industry that merely represented a struggle to obtain an "un-earned increment."

The enormous consumption of the district was easily ascertained by the published returns, and the rates of carriage were

known and read of all men, and also paid. The productions of the area to be served by the Canal included upwards of three-fourths of the cotton trade, the greater portion of the woollen, glass, chemicals, pottery, salt, coal, iron, and machinery trades, with a number of minor industries that total to a respectable sum. The district could thus establish an absolute moral right to demand that its supplies should come direct, and the provision of means to secure that end was elevated into a public duty by the emergencies of commerce. The maximum rates and charges by Ship Canal are fixed by schedule attached to the 1885 Act, authorising construction and incorporating the company. They represent an average saving of about 50 per cent on the rates prevailing at the time when it passed, which rates had then been recently defended successfully before a Royal Commission; they also represent an excellent profit. They can be reduced without risk of serious loss, and any competition means ultimate discomfiture to the opponent, whatever show of fight may be made for a time. These rates cannot be approached in the instances of raw and bulky material, food products not immediately perishable and requiring cheap transit, and heavy textile manufactures, the former being brought right up to the place where they are to be paid for and used—the latter sent back again by those who have transformed the raw material direct to those who want the goods; simply avoiding the people who have nothing to do with it, but who are merely waiting to tax it.

The case was submitted to everybody concerned with a fulness of detail, explicit statement, printed data and public challenge, that has never occurred before and is not likely soon to be matched.

Three hundred and twenty-six petitions in favour were presented by municipalities, chambers of commerce, various trading and manufacturing companies, including one from the Associated Chambers of Commerce and one from Manchester and district signed by 187,340 persons. The subscriptions for Parliamentary and other expenses amounted on July 23, 1883, to £65,750, the list being headed by 17 subscribers of £1,000 each, eight of £500, the workmen of Daniel Adamson and Co., Dukinfield, £430, two for £300, and 25 for £250 each. The subscription ultimately exceeded £100,000; and, in addition to this, on October 6, 1884, a Manchester town's meeting passed a resolution to contribute a 2d. rate. Assistance on the same basis was agreed to by the Salford ratepayers and also by those of Warrington during the same month.

The struggle for Parliamentary powers to make the Canal was continued over three sessions against the unrelenting opposition of the Mersey Docks and Harbour Board, the Liverpool Corporation, the railway companies, owners of estates, and

other public and private bodies. "Worse than fighting your way through an enemy's country," a friend of mine said. The following is a summary of the Parliamentary performances:—

SESSIONS 1883-4-5.

Session.	House.	Chairman.	Com- menced.	Finished.	Result.	No. of Days.
1883	Commons	Sir Joseph Bailey	May 1st	July 6th	Agreed to	39
"	Lords	Earl of Camperdown	July 30th	August 9th	Not passed	10
1884	Lords	Duke of Richmond	March 11th	May 24th	Agreed to	41
"	Commons	Rt. Hon. G. Selater-Booth	July 7th	August 1st	Not passed	20
1885	Lords	Earl Cowper	March 12th	May 7th	Agreed to	30
"	Commons	Rt. Hon. W. E. Forster	June 15th	August 3rd	Agreed to	35
Days						175

In the final event the Rt. Hon. W. E. Forster said: "The conclusion we have come to, I am very glad to say, is unanimous."

The Act of Parliament received the Royal Assent, August 6th, 1885. It covers 322 pages, and consists of 218 sections, 64 of which are for the so-called protection of "vested interests."

Every branch of trade, including shipowners, corn traders, cotton spinners, textile manufacturers, timber merchants, sugar refiners, fruit and vegetable dealers, and cattle traders, were consulted, and signed a powerful adhesion. These signatures and promises, obtained in a very brief space of time, represented in one direction an aggregate net tonnage of 1,000,000 tons, and in another more than half the owners of the goods the ships conveyed. This is part of what the 185 shipowners put their names to in 1886, which was subsequently twice confirmed: "With quay accommodation and facilities for loading and discharging with despatch, and if the charges on the ship are not higher than those at other ports, shipowners will make use of the Canal so soon as it is open for traffic. The additional thirty-five miles would not increase the rate of freight charged by a merchant steamer for a long voyage." Ship dues to Manchester have not yet been charged, and in all the early estimates they were given as a possible supplementary source of revenue, and not included in the figures that were kept before the public.

The secret of every well-organised mission is to keep in touch with everything kindred and representative, to keep the ball moving, to be constantly urging what you are sure of, inviting and compelling controversy, and making successful results well known. There are many people not open to argument for obvious reasons, but most of these are influenced or infected by example. The large and various constituency just

indicated, so carefully got together, was kept compact and well informed, directors and officials moving constantly in and out amongst those nearest the base of operations, the press generously recording and encouraging progress.

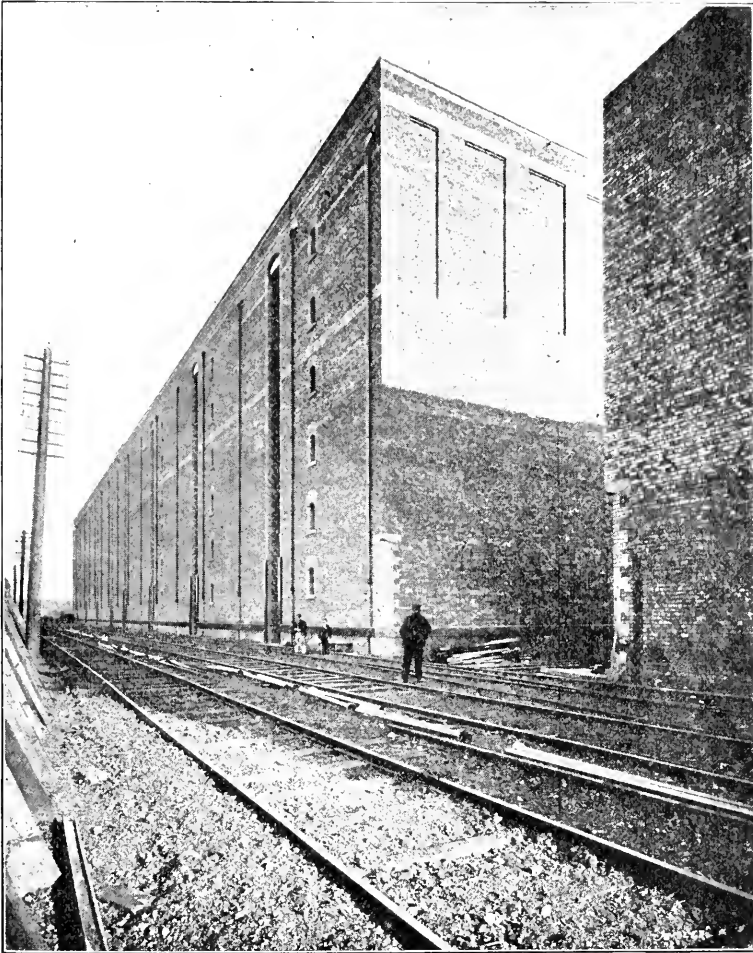
The episode of the frank and unselfish introduction of the project, backed by liberal subscriptions towards the cost of promotion both in and out of Parliament, gave the first great impulse; and the second great win for the cause was the favourable report of the Consultative Committee, backed by handsome subscriptions for shares, issued in 1886 after protracted deliberations extending over two months. This committee was called together by the Mayor of Manchester (Alderman Goldschmidt), and its decision was anxiously awaited as a virtual settlement of the question "to be or not to be"—the latter, certainly for a considerable time, if adverse.

The result was at once conveyed all round the circle; more meetings were held, courtesies exchanged and connecting links forged. Glasgow said, cheerily: "Go on and prosper, as you will do if you proceed as you are doing. Think of us and our little trickling Clyde, crossed by means of stepping stones only 120 years ago. We did not think our tonnage worth recording until 1831, when it stood at 732,327, revenue £18,392; but 50 years later this had grown to more than 3,000,000 tons, producing a trifle over £248,000 a year, and the population had grown also from 203,000 to 369,000. We owe all this to our navigation, without which our turnover would never have got beyond a few salmon."

Newcastle said, heartily, it reminded them of old times when they were paddling in 6ft. of water where they now have a depth of 22ft. at low tide, with a greatly increased width, gained by removing some 70,000,000 tons of obstructive material from the river bed, cutting off promontories and exploding a rocky cliff—Bill Point—that stood 72ft. above high water and extended 450ft. into the stream. And all this, together with the removal of a bar, which secured a low water depth of more than 20ft. instead of 6½ft., all the result of private enterprise and local determination.

Middlesbrough, too, was full of encouragement, and quoted from its proud register of difficulties conquered since 1808, when her sons went down the banks of the Tees towards Stockton to tow the ships by means of shoulder ropes. Since 1885 at least 20 miles of training walls have been built, and 2,000,000 tons of gravel and clay cleared from the channel; the waterway is 200ft. wide at Stockton and 500ft. at Middlesbrough; in 1863 the depth was 3ft. 6in., now it is 20ft. At one point 120,000 cubic yards of rock had to be broken up to a depth of 16½ft. and removed from the course; 2,600 acres of land had been reclaimed and about half of it sold.

The Provost of Dundee said to the writer: "I consider that the members of corporations ought to fraternise and do all they can to encourage and help each other in these large efforts for the public good."



A BLOCK OF THE SEVEN-STOREY WAREHOUSES.

This is sufficient to indicate the spirit that prevailed during the days of marching and camping out. Three years later, representatives from all these places and industries came at

different times to see the beginning of the fulfilment of what Jacob Bright called "this great design," and all those occasions have become historical.

VI.

The embarrassment of riches does not cease with the third and last aspect of the subject to be dealt with in this paper—what the Ship Canal has accomplished and what it can do.

Manchester is at once a natural terminus and starting point, a centre of great activity both ways. We have seen that 170 industrial towns helped to make the Canal, and an undisputed six millions of people have a direct and personal interest in supporting it, either in connection with what they make, what they use, or what they eat. In every instance relating to things that may be called essential the use of it means a saving, generally a large one; but when the saving looks small, regarded from the individual point of view, it still means a great deal to the individual, because to employers it frequently signifies a profit, and thus enables them to continue the operations upon which those individuals depend. This is the commercial view of what the Canal can do, that could not have been secured and would soon disappear without it, and should be kept constantly in sight. The continuance of these advantages depends entirely upon the presence and successful working of the Canal. The circumstances which rendered it necessary have not materially altered, and nothing has occurred to show that the same results could have been obtained in any other way, or that any permanent concessions of importance could be reasonably expected from any of the existing systems of transport.

The commercial case for the Ship Canal must always be considered in connection with the fixed and unalterable position of the railways. The frank manner in which the Liverpool deputation (1895) seeking a reduction of the railway rates was met by a polite but direct negative, should have revealed something to the most dense, and must have been a matter of certain knowledge to any one taking the trouble to find out what sort of a reduction must be made to be of any use whatever in competition. That deputation was a striking instance of the blind confidence some people cherish in the ability of the railway companies to reduce their rates to any level required to defeat anything else however legitimate, quite regardless of permanent charges or fixed cost. I do not believe that the railway companies really regard the Canal with the enmity with which they are often debited, because whatever tends to increase the stability of trade and manufacture must directly benefit them in their best paying departments, and most of the heavy traffic the Canal was built to take over and make a good profit out of, has been most distinctly referred to by them

on several important occasions as an unprofitable burden. The traffic the Canal was made to accommodate includes cotton, wool, flax, iron, iron ore, timber, oils, dyewoods, paper, paper-making materials, food stuffs, and also cattle. These the people within its area require for their own workmanship and consumption. They are not harassing any other centre of handicraft nor withdrawing anything from any place to which it can show a clear title. Their object has always been definite and their methods consistent; that object was to get relief from a tax to some extent justifiable, so long as it was inevitable, but which was made so only by the existence of a land barrier between Manchester—the commercial centre of this district—and the sea over which the material travels. For the return journey they offer the work of their hands and the productions of their mines—machinery, many articles of skilled manufacture, and abundant coal. “In what other part of the globe,” said M. Fleury, the French expert, “are these two conditions so combined?” referring to the power of using raw productions and the power of producing what is wanted in all parts of the world.

Just before the Canal campaign commenced a Railway Rates Commission had been sitting, and much of the evidence there adduced had a direct bearing on the new case. One statement was that minerals were carried at a rate averaging 1s. 9½d. per ton when their movement cost 2s. 2½d. (Five years later a further reluctant reduction of 2d. was obtained.) Mr. Findlay (London and North-Western Railway), combating the charge that Liverpool was unjustly hindered by the rates levied between that town and Manchester, explained that after paying terminal and collecting charges only 1s. 9d. was left for the thirty-one and a half miles of actual main line carriage out of the 9s. 2d. then paid for case and bale goods; and on November 1st, 1885, in consequence of the passing of the Ship Canal Act, this rate was reduced to 8s., leaving a margin of 7d. only. The Company's terminal buildings in Manchester and Liverpool cost £2,750,000, and £110,000 a year has to come out of earnings to pay 4 per cent on that. This is £6,000 more than the estimated cost of ordinary maintenance of the entire length of the completed Canal, which is set down at £2,000 per mile, and £400 per acre of docks. The goods stations at Liverpool alone cost more than the Canal Company paid for the Bridgewater Canal—a property 42 miles long, with 220 acres of docks and warehouses. After the Manchester and Liverpool terminal charges have been paid, there are, including shuntings, 57 miles of permanent way, wear and tear, steam power, and labour to be considered. It was said that during the first eleven months of the Canal's existence there was a difference of £400,000 in the railway turnover, caused by diverted traffic and reduction of rates, many of the latter probably private, and certainly temporary.

If there was previously a loss on part of this, and only a comparatively small advantage on the best of it, what does it matter, and why pretend to compete? Hence the merit of the flat refusal to the deputation.

The Canal is able to take over this heavy and in some cases almost barren traffic, and out of it can make a good position for itself, raise the industrial status of a great manufacturing district, including at any rate from two to three million adult skilled workers, and by thus improving the position of employers, which signifies for the men more regular employment, and as a result larger means for purchasing and travelling, the railways must be greatly helped in their two revenue-making departments—passenger and special traffic. Third-class passengers at fifteen to the ton yield 1s. 3d. per ton per mile for haulage only, as they load and discharge themselves, while it is stated that 3d. or 3½d. is the full average yield for heavy goods, including handling. Water carriage was intended to co-operate, not to compete, and each means of transport has a wide and definite sphere. The railway companies rightly decline combat with a foregone conclusion, merely to save some people the trouble of putting their business into the right grooves, knowing that if they carried many of these goods free of charge between Manchester and Liverpool the Canal could still offer inducements and pay its way, upon the basis of the Parliamentary schedule, beyond which it cannot and does not want to move.

On the 8th October, 1886, Mr. (now Sir) Bosdin T. Leech wrote in one of his vigorous letters: "I am prepared to prove that if the railways reduce their rates seventy-five per cent, the other benefits to Lancashire could still justify the introduction of independent through water communication. As the railways cost in primary working expenses about 55 per cent, and as 92½ per cent of the gross receipts even of the prosperous London and North-Western Railway disappear before the shareholders make a division, it is quite evident that the railways could not if they would enter into damaging competition with the Canal, which must be supreme for heavy goods not requiring speed."

The following are some of the savings per ton that were shown to be possible when Parliamentary permission to make the canal was obtained in 1885, after allowing for the reduction in railway rates made soon after the Bill passed. The comparison is between overland from Liverpool, and delivered in Manchester by the Ship Canal; cotton 6s. 8d. out of 13s. 8d., wool 8s. 8d. out of 16s. 5d., sugar loaves 11s. 3d. out of 17s. 11d., raw sugar 7s. 3d. out of 12s. 2d., bacon 8s. 5d. out of 15s., tinned meats 9s. 5d. out of 17s. 5d., tea 9s. 7d. out of 18s. 2d., wheat 5s. 1d. out of 9s. 11d., oranges 8s. 10d. out of 15s., petroleum 8s. 6d.

out of 14s. 5d., tallow 7s. 8d. out of 13s. 6d., iron ore 4s. 1d. out of 6s. 11d., timber 4s. 8d. out of 9s. 5d.

Before going any further afield let us see how far this promise has been realised.

In November, 1893, two months before the Canal was opened for traffic, these figures, with many others upon which the Ship Canal case was based, were frankly reprinted by the Company as a direct reminder and means of test, and on November 21st, 1894, a comparative statement was issued, which has since been reprinted and confirmed, of which the following is a summary, and to which I have added the fourth column:—

	Cost via Liverpool to cart, Manchester.	Via Ship Canal to cart, Manchester.	Saving shown in 1885.	Present saving by Canal, 1896.
Cotton	13 8	6 3	6 8	7 5
Apples	15 3	5 0		10 3
Oranges	14 9	6 0	8 10	8 9
Tomatoes	18 7	6 0		12 7
Iron Ore	6 11	1 0	4 1	5 11
Oil in Casks	13 10	4 9	8 6	9 1
Butter	15 6	6 3		9 3
Cheese	14 9	6 3		8 6
Bacon and Hams	15 0	6 3	8 5	8 9
Tinned Meats	17 5	6 3	9 5	11 2
Tea	18 8	7 3	9 7	11 5
Sugar in bags or casks	12 2	4 9	7 3	7 5
Paper	15 0	5 3		9 9
Tallow	13 6	4 9	7 8	8 9
Dyewoods	11 2	4 0		7 2
Timber, Logs	10 6	3 9		6 9
" Deals, Battens, and Boards	8 11	3 0		5 11
" Furniture Wood, Mahogany, &c.	12 4	4 0		8 4
Wool	16 4	6 3	8 8	10 1
Wood Pulp (Dry)	10 2	3 9		6 5
Wood Pulp (Wet)	10 2	2 9		7 5
Grain, Wheat (in sacks)	9 10	3 6	5 1	6 4
Flour	10 9	3 9		7 0
Onions	13 8	4 0		9 8

From this it will be seen that the promises of 1885 have been more than fulfilled, and that the benefits extend beyond the original list, which was intended merely as an indication of what might be generally expected. In order to show that these advantages belong to the entire Ship Canal area, a similar analysis has been applied to a number of the principal towns, with results proportionately satisfactory, the limitation of advantage, where such occurs, is in almost every case due to the absence of independent water access in the shape of barge canals. Three typical instances may be taken, all large users of raw materials and consumers of food. (1) Ashton, with an industrial population of 42,000, is 41 miles from Liverpool and 10 from Manchester. The total cost of carriage of cotton *via* Liverpool is 16s. 11d. per ton, *via* Manchester it is 11s, showing a saving of more than a third. The reduced railway rate

from Liverpool to Ashton is 10s. 5d., but to compete with the Canal it would require to be brought down to 4s. 6d., out of which 3s. 9d. must be deducted for terminal charges, leaving 9d. only to pay for 41 miles of carriage. (2) Todmorden, with 25,000 inhabitants, is 49 miles from Liverpool, and 24 from Manchester; total cost per ton *via* Liverpool 20s. 2d., *via* Manchester 14s., present railway rate 13s. 8d., rate to compete 7s. 6d. (3) Oldham, population 135,000, using about 160,000 tons of cotton a year, is crowded with cotton mills and machinery works. It is only seven-and-a-half miles from Manchester, forming part of Lancashire's inner circle, and the saving on cotton brought *viâ* Ship Canal and delivered there is 6s. 8d. out of 17s. 8d. The rail rate from Liverpool in order to reach the canal level would have to climb down from 10s. 8d. to 4s. 6d., or 9d. over the terminal charges as in the case of Ashton.

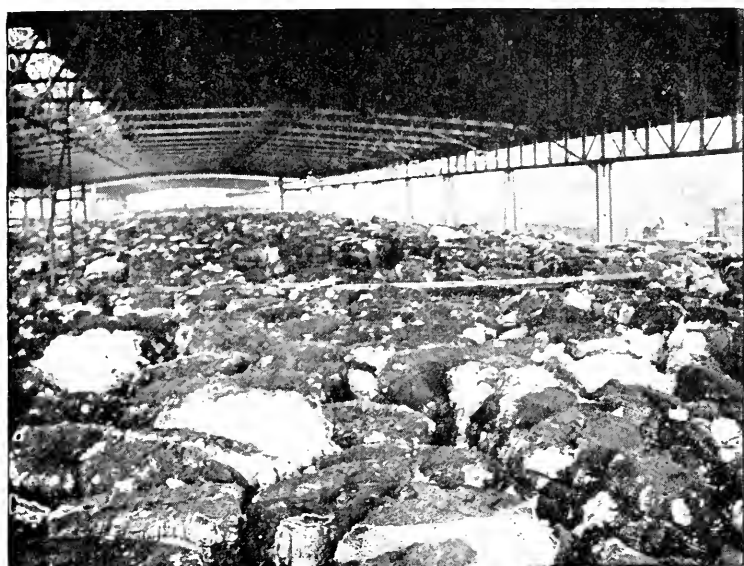
Wool from *ex* ship Liverpool to Manchester costs 16s. 4d. per ton, *viâ* canal it costs 6s. 3d. Halifax is 34 miles from Manchester, but there is independent water communication; much of the material required by the carpet and woollen manufacturers of this district has been brought round by Hull, at a saving of 2s. per ton over Liverpool. By the Ship Canal there is a further saving of 4s. 6d. secured, the total charge being 20s. against 26s. 6d. The manufactured articles will surely be returned by the same route, which is thirty miles nearer than Hull.

Iron and iron ore afford one of the most telling instances of the use and fitness of water carriage for weighty materials that are also awkward to handle. The various branches of the iron trade of Lancashire and the neighbourhood have probably suffered more from oppressive rates than any other branch of industry. In 1885 this was referred to in Parliament as amounting in some cases to as much as 117 per cent, a prohibitive tax. As two-thirds of the puddling furnaces and one-third of the rolling mills of Great Britain are to be found within the area directly served by the Ship Canal, and as one-third of the machinery exported from the United Kingdom proceeds from the same quarter, the vast importance of an all-round release in this direction is at once seen. The extent of that release is, that while pig iron costs *viâ* Liverpool to Manchester 6s. 10½d., and iron ore 6s. 11d. per ton, by Ship Canal they cost respectively 2s. 2d. and 1s. per ton; and while machinery in parts and in cases, collected from the makers' works to "free on board" at Liverpool, costs 13s. 11d., and at Hull 18s. 6d. per ton, it costs at Manchester 6s. only, with proportionate reductions for other kinds of machinery carried at owner's risk, in two and four ton lots.

The chairman, Mr. J. K. Bythell, after the Canal had been

opened eight months, said that he could multiply instances in which the trade of the district had been helped enormously by the savings which the Canal made absolute, and gave "chapter and verse" for two as being typical—(1) Cotton Yarns to the Continent cost 32s. 6d. per ton before the Canal was opened, the rate by Canal is 20s.; (2) Sugar from Hamburg formerly cost 22s. 6d., by Canal it is 12s. 6d. per ton.

The Manchester Wholesale Co-operative Society invested £20,000 in the Canal, and before it had been opened eight months it was publicly stated by one of their own officials that the society had very nearly recovered that amount.



FIRST SHED FULL OF COTTON AT MANCHESTER DOCKS.

Many economic writers have dealt with the subject of what the Canal has been the means of doing for Lancashire, and the following, from an article on "Manchester's Advance" in the *Manchester City News*, July 11th, 1896, is a fair expression of expert opinion:—

"In the course of an interview with another practical authority, not belonging to Manchester but well acquainted with our principal ports and all shipping ways and means, the question was put how far he considered the Manchester people were justified in associating the Ship Canal with the improved state of things? He said he thought the connection extended in every direction. The establishment of an industrial port

was always a safe and sound proceeding, and, in the particular case of Manchester, few ports had attained such a position in so short a time. There were no signs of amelioration until the Canal had become assured, and it had been shown by direct proof, and equally direct inference, that the presence of the Canal had saved the district fully £800,000 a year; consequently, quite £2,000,000 had been added to the industrial treasury, which meant a general benefit as certainly as the circulation of the blood affects every part of the human system. In the absence of the Ship Canal nothing of this would have happened, and there is no basis for the belief that any amount of effort could have drawn vitality out of the old conditions.”*

Any substantial reductions on the part of the Mersey Docks and Harbour Board would be equally trying. When that Board was formed in 1857 it had to reckon with a sturdy group of vested interests, developed and nurtured by the Liverpool Corporation during a period of 150 years, and its bond-debt—not by any means directly representing value received in works or property by the Board or the estate—amounts to more than £16,000,000. So this burden of taxation may be said to serve the wholesome purpose of preventing the establishment of a monopoly, which always means the inflation of one part by the depression of another. Referring to the recent appeal (1895) to that Board by the Liverpool Cotton Association and the Fruit Brokers for a reduction of charges, the chairman of the Finance Committee, Mr. Robert Gladstone, said, in effect, that he would not vote against a reduction when it was proposed, but he could not say when that would be. He had always held that some of this traffic would pass forward to Manchester as it was unmistakably the natural centre for it.

What was probably at the bottom of that speech was the knowledge, which anybody could gain with very little trouble, that if the *whole* of the Board charges were knocked off, amounting to 3s. per ton for cotton,† Manchester could still offer an advantage of 4s. and 5s. per ton to all who could cart their cotton from the docks, and an average of 3s. per ton to all the surrounding towns, while the saving on fruit represents a still larger percentage. Let us hope that this speech of Mr. Gladstone's, and the common sense grasp of the situation thus expressed in the *Liverpool Mercury* of October 2nd—“When

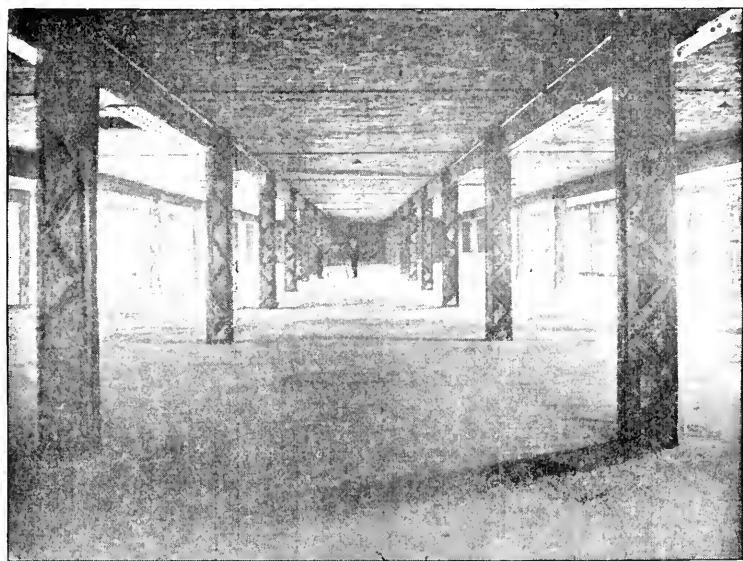
* Mr. Alderman Southern, in an important speech before the Manchester City Council, in April, 1896, said—“Complete success depends entirely on the development of traffic; there is abundant traffic to be secured to ensure success.” He also quoted a report prepared for him by Mr. W. H. Collier, who has since been appointed Manager of the Ship Canal, and whose whole commercial training has been in the midst of the traffic of the district, in connection with the Bridgewater Canal. That report gives the bases of these estimates of savings, and it has since been adopted and supplemented in a most valuable manner with banking and other statistics, by Mr. A. Woodroffe Fletcher, in a paper read before the Manchester Statistical Society, February 10th, 1897, on “The Economic Results of the Ship Canal on Manchester and the Surrounding District.”

† A futile shilling has since been taken off.

the Canal was made a competition to some extent with our own port was inevitable . . . but the field of activity is still wide enough to enable compensation to be sought and found in other directions"—let us hope that these may be taken as signifying the advent of the time when "the envy of Ephraim shall depart and the adversaries of Judah shall be cut off; Ephraim shall not envy Judah, and Judah shall not vex Ephraim."

I pass over quite a score of points upon which it would be profitable to touch, all closely related to our subject and necessary to its complete demonstration.

Another chapter could be fully occupied on the lines of the last ten minutes, showing that the Canal is able and willing to



SECOND STOREY OF THREE-STOREY SHED.

complete its programme on the terms announced by its commercial heralds—showing, also, that every concession already gained by the community is part redemption of the original promises, whose complete fulfilment can be and can only be obtained by complete fidelity to the original engagements and clearly defined purpose, and that the delays, hindrances, and obstacles that have occurred, and may occur, are not part of it, but are cast in its way either by ignorance, prejudice, or cupidity. They have nothing whatever to do with its capabilities or capacity, both of which now belong to the settled order of things. No month has passed yet without solid advance

in some important direction, although one is reminded with painful frequency of those biting words of Tennyson—

But these are the days of advance, the works of the men of mind,
When who but a fool would have faith in a tradesman's ware, or his word?
Is it peace or war? Civil war, as I think, and that of a kind,
The viler, as underhand, not openly bearing the sword.

The work is proceeding without intermission, but the nature of it does not admit of a daily register, even friends must wait for results, and every individual one should work while he waits. Every advance means a death-blow to something that should not be allowed to live, that is against right principle, and consequently adverse to the general good; rings have to be broken and cliques dispersed that are not formed for the help or defence of the community, but for defiance rather and private emolument only.

It is no longer a question of the physical capacity of the Canal—that is proved; or of safety or economy—they are accepted. It has now become a matter of steady and persistent assertion against the usual hindrances that have harassed and will probably continue to impede every forward movement; all such movements must of necessity jostle something else, but there never was a period when more reasonable or willing concessions were made in recognition of every form of displacement or territorial right. And this fragment of contemporary history cannot be better concluded than by the simple statement of traffic and receipts so far.

	1894.	1895.	1896.
Traffic—Tons...	925,659	1,358,875	1,826,237
Receipts.....	£94,656	£136,759	£179,834

CAPITAL EXPENDITURE TO DECEMBER 31, 1893.

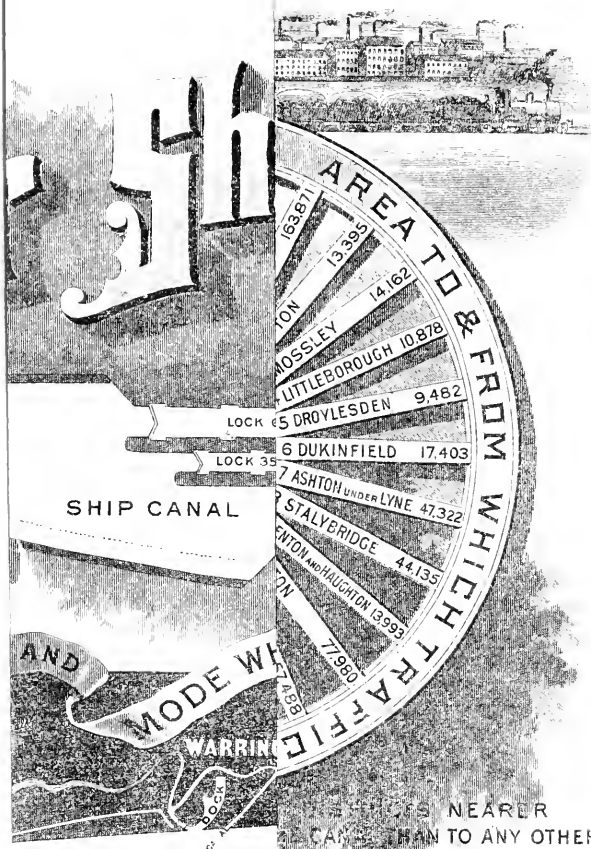
(Canal opened for Traffic January 1, 1894.)

For Construction and all expenses	£11,750,000
Land and Compensation	1,330,000
Bridgewater Canals Property	1,780,000
	£14,860,000

CAPITAL POWERS.

Ordinary Shares	£4,000,000
Preference Shares	4,000,000
	£8,000,000
Perpetual 3½ per cent 1st Mortgage Debentures	£1,359,000
1st Mortgage Debentures—1914	453,000
2nd Mortgage Debentures—1914	600,000
New Mortgage Debentures — (Manchester Corporation Loan)	5,000,000
	7,412,000
	£15,412,000

[The four larger pictures are from photographs by J. Ambler, Market Street; and the three smaller ones, kindly lent by the publishers of the *Paper Makers' Circular*, from photographs by Mr. E. Ward, Oxford Street.]



RAILWAYS
IN
DIRECT
COMMUNICATION
WITH THE
SHIP CANAL.

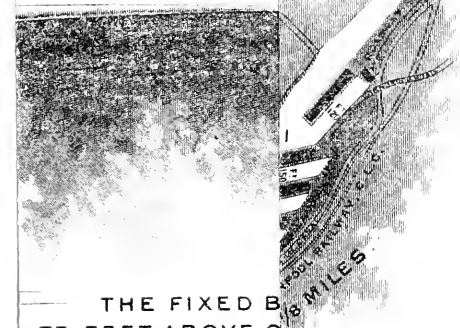
- LONDON
- AND NORTH
- WESTERN
- G^T WESTERN
- MIDLAND
- LANCASHIRE
- & YORKSHIRE
- G^T NORTHERN
- MANCHESTER
- SHEFFIELD &
- LINCOLNSHIRE
- CHESHIRE LINES

TOUGRE CANAL
DARESBURY
Minimum
Average
Minimum Width of
Depth between Bart
at bottom 170 F^t a

NEARER
CANALS THAN TO ANY OTHER
STEAMSHIP PORT CONTAIN A
POPULATION OF 7500,000.



DOCKS

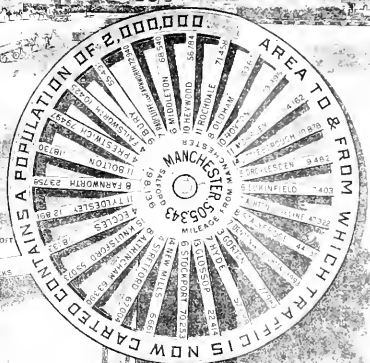


CANALS
IN
COMMUNICATION
WITH
SHIP CANAL.

BRIDGEWATER
SHROPSHIRE UNION
WEAVER NAVIGATION
TRENT & MERSEY
LEEDS & LIVERPOOL
ROCHDALE
BURY & BOLTON
ASHTON
HUDDERSFIELD
STOCKPORT
MACCLESFIELD
PEAK FOREST
CALDER & HEbble
AIRE & CALDER



Total Length of Ship Canal, 35½ Miles
Minimum depth 26 FT
Average Width of Canal at Water Level, 172 FT
Minimum Width of Canal at bottom 120 FT
except between Barton & Manchester where
it is at bottom 170 FT at water level, 230 FT



THIS IS NEARER
TO THE CANAL THAN TO ANY OTHER
SEA-STEAMSHIP PORT CONTAINING A
POPULATION OF 7,500,000



RAILWAYS
IN
DIRECT
COMMUNICATION
WITH THE
SHIP CANAL

LONDON
AND NORTH
WESTERN
G. WESTERN
M. D. LAND
LANCASHIRE
& YORKSHIRE
G. NORTHERN
MANCHESTER
SHEFFIELD &
LINCOLNSHIRE
CHESHIRE & LING

EASTHAM LOCKS.

THE FIXED BRIDGES ARE ALL
75 FEET ABOVE ORDINARY WATER LEVEL

PETROLEUM: ITS USE MECHANICALLY, COMMERCIALY,
AND MEDICINALLY.

BY MR. DERBYSHIRE MAYALL, of Manchester.

[Addressed to the Members in the Library, Monday, May 6th, 1895.]

ORIGIN.

THE origin of petroleum is still an unsolved problem. We have no precise knowledge of the manner in which it was formed, and it appears probable that the processes were not in all cases identical. There are only two theories with regard to the origin of petroleum which I consider it worth while to investigate.

1st. The theory which receives the greater measure of support, ascribes the production of petroleum to the decomposition of animal and vegetable matter. That it is in some way connected with the palæozoic era and with the vastly abundant accumulations of sea weeds, the marks of which are so numerous in the rocks, with the vast numbers of sea animals the skeletons of which make up a large portion of the limestone formations, and with the carboniferous era when the earth was covered with a rank and marshy growth of moisture-loving plants, and the air was charged with aqueous vapours and carbonic acid, whilst the seas teemed with the lower forms of animal life, seems very evident. The convulsions to which the earth was at this age subject; the alternate submergence and elevation of the surface occurring caused both animal and vegetable forms to become covered with the sands of the seas. The successive changes, or processes, resulted in the formation of beds of animal and vegetable matter which produced, by slow decomposition, the subject-matter of this address, which is now stored in the earth for the use of mankind.

The exact process of its manufacture, of its transfer, and of its storage is unknown. That it ascended rather than descended seems indicated by the fact that the lowest sand holds oil whilst those above do not, and that the upper sands hold oil only where they extend beyond or overhang the lower.

2nd. THE CHEMICAL THEORY, so-called, which looks upon petroleum as condensed gas evolved from carbonaceous shale lying at a greater or lesser depth below the oil sands, must face this objection, that such a process if chemically possible (which is doubtful) ought to have distributed the oil everywhere, and permanently blackened the earth's crust for several thousand feet. Such, however, is not the case. Again, the carbonaceous gas-producing agents only become oil-producing through the superposition of the sandstone, which acts as a reservoir and collects and retains the oil; therefore there must be carbonaceous shale to generate the gas and sandstone, or sandbeds to distil and collect it. If the shale be wanting no gas can come up for condensation in the sandrock, and if the sandrocks are wanting there are no reservoirs to receive and condense the gas, and it continues an upward tendency to the surface and escapes. As a matter of fact, however, although these two are found in

exactly the manner previously indicated in the Bradford oil district of McKean County, such is not generally the case at Ridgeway, in the Elk County. Again, in Pennsylvania, whilst you have in some wells distinct traces of both these strata, there is only a very slight indication of gas; whilst at Titusville drilling operations have proved the presence of both strata previously indicated and in the manner indicated, and large quantities of gas, but no oil.

For the sake of argument it may be assumed that the deposit of carbonaceous matter in this district must be of much more recent date, and that although large quantities of gas have been generated, the process of distillation and collection is not complete and that ultimately oil will be found. This hypothesis, however, I think, may be fairly assumed to be disposed of by the fact that in the same district, and exactly under the same geological conditions, both gas and oil are found.

I might, did time permit, bring forward records of drilling operations by the score in favour of this theory, and of others distinctly opposed to it. The greatest factor, however, in leading me to the support of the former theory is that the authorities who support the latter one fail to explain the reason for the entire absence of petroleum from immense areas of not only shale but also sand and gravel rocks of similar construction and underlaid by the same geological formations. Neither one nor the other theory has been conclusively proved, and, whilst admitting that there is much to be said in favour of both, I am inclined to the former, but admit that the latter is worthy of much patient and careful consideration before disposing of it as absolutely worthless. When we have discovered the place and ascertained the origin and conditions of its birth, studied its constitution and habits, so to speak, and become intimately familiar with its associate gas, then we may possibly be able to propound a tenable theory and to explain its origin. But at present, with all these points in dispute, or shall I say imperfectly understood, we must treat the question of its origin as one that may very properly be discussed but cannot be satisfactorily answered. The probabilities are that we shall yet discover that there is what might be called an indigenous oil in strict conformity with the one theory and an exotic oil in agreement with the other.

ITS AGE.

The oil business is no new thing—it is as old as the Scriptures. Job was an oil man; he struck the rock, and it poured forth rivers of oil. He got rich in the oil business. (Job xxix. 6.) The existence of petroleum has been known from the most remote ages of which any records have been preserved. A kind of petroleum is distinctly referred to in the book of Genesis, under the name of slime, in the English version, and was employed in the mixing of the mortar used in the construction of the Tower of Babel; and the employment by the Egyptians of a similar material for embalming the dead was mentioned by historians who wrote prior to the commencement of the Christian era. Probably its existence was known 2,500 years ago, for the so-called eternal fires of Surakhani, frequented by the Persian fire-worshippers from the time of Zoroaster, who lived not later than 600 B.C., were located on the shores of the Caspian Sea, on the exact spot where Messrs. Nobel's works now stand. Similar references are stated to occur in the very ancient records of the Chinese nation.

From A.D. 50 when Pliny mentions the use of the oil of Agrigentum in lamps, we find frequent references to the uses of petroleum in the works of historical writers, and it would appear that the oil was used for illuminating purposes as well as a medicinal agent for outward application in cutaneous disorders, etc., to which I shall have occasion to refer later on.

PRODUCTION.

In many places the oil flows naturally from the earth, especially in the neighbourhood of springs or streams. This is especially noticeable around Titusville, where, on the 30th December, 1854, Messrs. Ereleth and Bissel organised the famous Pennsylvanian Rock Oil Co. for the purpose of collecting Seneca Oil, as it was then called, from a series of trenches where the strange fluid came up in globules and spread over the water wherever a ditch was dug; and in the Alleghany County, 16 miles N.E. of the recently discovered Pennsylvanian oil district, where the first historical record—that contained in a letter written July 18th, 1627 (referred to in Segard's History of Canada), by the French Missionary, Joseph Delaroché, who speaks of an oil spring as the *Fontaine-de-bitume*—indicates that oil was collected from the pools of water by skimming the surface, a similar process to that resorted to in separating the cream from a milk pan. There are also records of its having been collected by the Indians at a very early date, by stretching their blankets on the surface of the water, and then wringing out the oil absorbed by the fabric. In 1833 Dr. S. P. Hildreth in a paper on "Saliferous Rock Formation of the Valley of the Ohio" says: "In many wells salt water and inflammable gas rise in conformity with a steady uniform flow, the gas escaping and the oil remaining on the surface of the pools. The quantity obtainable by this primitive method being small and expensive, it became customary to dig pits or shallow wells, in which the oil was collected. After five years of ill success and discouragement with pick and shovel, Colonel Drake, in 1857, introduced a method of drilling for oil, and in the August of that year the quiet little hamlet of Titusville was electrified by the report that petroleum had been tapped at a depth of 70ft. from the surface, and that the now historic Drake well was producing barrels of oil where previously they had only been able to secure gallons. Since that time over 60,000 wells have been sunk, and vast improvements have been made in the method of drilling, a 2,000ft. deep well being now drilled and tapped with greater ease and less cost than was the case in those days with a 70ft. well; and the knowledge that recently the Watson well within two miles of the original venture has been drilled to a depth of 3,553ft. at a less cost, will not come to us as a surprise."

The daily output of the States, has developed enormously since that date. In 1859 it was 2,000 barrels, in 1890 454,155,382 barrels.

DRILLING.

The diameter of a petroleum well in America is not usually more than 10in. at the surface of the ground and 5½in. at the bottom. The surface ground having been removed until the stratum of the rock is laid bare, a timber framework or derrick (with which we are all familiar) is erected for the purpose of raising and lowering the drilling tools when drilling and for placing into position the pipes and sucker rods (to which I shall refer later on). The derrick requires to be of great strength, as not only has it to sustain the drilling tools which weigh 3,000 to 4,000lbs., but is subjected to immense strain by reason of its having to rebut the concussion caused by the repeated blows of the drills on the hard strata, propelled by an engine of 30 to 40 horse power. Having erected your derrick, engine, and pump, and the drill penetrated to the depth of the first stratum, an iron tubing is inserted, being introduced by the medium of the derrick and mall to the requisite depth, the powdered rock removed, the drills meantime being abstracted and sharpened, each stratum as reached being cased with the iron pipe until the oil-bearing strata are reached. If, on the requisite depth being attained, the presence of water be determined by what are known as fishing experiments, another iron pipe or casing is

inserted, a vacuum caused (by the insertion of what is termed by oil drillers a seed bag) and the pump is then set in motion. The water is abstracted by this means, and in order to facilitate the inflow of oil from the sand rocks, a torpedo, introduced by Col. E. Roberts in 1862, consisting of a simple tin case or shell, and having a percussion cap fixed on the upper end in such a manner that a slight blow upon it will cause an explosion, is lowered into the casing or iron pipe by means of a cord or wire and held suspended at a point in the sandrock as previously described, where the oil is supposed to be held in storage. On this wire or cord in the hands of the operator is held a weight through which the cord or wire has been passed previous to it being lowered. When the torpedo is in the proper position the weight is released and, guided by the wire or cord, falls upon the cap and explodes the charge. Since 1878 this has been superseded by the use of nitro-glycerine, it being more easily introduced and more certain in its effect.

The charges exploded in deep wells to-day are enormous when compared with those of a few years ago. In the early days of its adoption, and with wells of 80 to 100ft. depth, from 2 to 10 quarts was considered a good shot, but now, with wells of a depth ranging from 2,500 to 3,000ft., 30 to 60 quarts or 100 to 200lb. are required. The method of firing is somewhat similar to that of torpedo firing, with this exception, that where the sandstone is found to be of more than ordinary thickness, a case or shell containing nitro-glycerine is lowered to the bottom of the well without a percussion cap on the surface; another case or shell is then introduced and lowered to rest upon the former one, this having a percussion cap on the surface. The weight is then lowered by means of the wire; falling on the cap the upper shell is exploded, the lower one is also ignited and an almost simultaneous explosion is the result. By this means the oil-bearing sandrocks are loosened, and the inflow of oil into the boring or well is facilitated.

PUMPING.

Pumping operations are usually then commenced. In some cases, however, owing, no doubt, to the pressure of gas generated in the sandstone rocks, the oil flows spontaneously for some time, but in the majority of cases pumping requires to be resorted to by means of a 30 to 40 horse power compound engine of a special type.

It will readily be understood that the drilling operation of an oil well is not only a tedious but a costly one, sometimes as much as £3,000 being spent, the result being only a very poor yield, and in others an entirely fruitless one, producing no oil at all, whilst others have yielded to their fortunate possessors more than a quarter million gallons in the 24 hours.

You will, no doubt, have observed that up to the present I have been almost solely dealing with the production of petroleum oil in America. I will, however, here remark that Russia is at present producing some 770 millions of gallons of oil per year. Inasmuch as I intend to deal with the commercial aspect later on, I will for a moment ask your attention to a few points of comparison between the two most prolific sources of supply.

1. I have previously remarked that in America the average diameter of the borings or well mouths at the surface is not usually more than 10in. and at the bottom 5½in., and the maximum depth 3,000ft. to 4,000ft., and that in the majority of cases it is necessary to resort to pumping operations to extract the oil from the bowels of the earth.

In Russia, however, the circumference of the boring or well is usually 24in. at the top and 11½in. at the bottom, and the maximum depth 800 to 1,000ft. ;

and it is by no means an uncommon occurrence for the oil to gush forth in an uncontrollable stream, like a mighty volcano pouring out its contents in a gigantic column to the height sometimes of 250 to 300ft., with a pressure of 200lbs. to the square inch. One well began to spout in this manner before the pipes could be fixed, and for four months projected a column of oil a foot in diameter to the height of 300ft., completely deluging the district with petroleum, and all efforts to check the outflow were unavailing.

To those who visit the Caspian petroleum district a sight of a fountain of this description is one which they should strive to witness—for the mighty column of oil leaping into the air, tossing its oliferous spray at the sport of the breeze, casting its prismatic colours along the sunbeams, and rushing with an almost terrifying roar, presents a spectacle of impressive grandeur.

2. The specific gravity of the Russian oil is about 0·850 to 0·920, whilst that of America ranges from 0·825 to 0·875.

3. The Russian oil contains a large percentage of residuum and lubricating, or oils of a denser quality, and produces only after precipitation by liquid caustic soda some 35 per cent of illuminating or oil of a superior quality, whilst that of America yields on an average about 75 per cent. The ordinary American oil is here referred to; but it must be remembered that in commerce there is also another oil of superior quality, of which a smaller percentage is obtained. I would here point out that one characteristic feature of the American oil is, that by distillation an oil of higher flash point, lower specific gravity, and greater illuminating power is produced; whereas in Russian oil up to the present it has been found impossible either by distillation or precipitation to produce an oil of superior quality similar to the American water white oil.

Fractional distillation produces *gasolene*, a liquid now being extensively used for improving the illuminating power of coal gas, and for rendering air capable of being burned for lighting purposes.

Benzine, a liquid used for detergent purposes, such as removing grease from textile fabrics.

Benzoline is a highly inflammable liquid, used in fairs and markets, and in sponge lamps.

Mineral oil, used extensively for lubricating purposes, and a residuum, to which is commonly given in America the name of petroleum coke.

I have endeavoured to give you, briefly, an outline of how petroleum is obtained in the crude state, collected and converted into a commercial product; and I will now ask your attention to some of the chief characteristic features of such of the products as are intended for mechanical, domestic, and medicinal uses. The list embraces for mechanical use:—

1. Mineral oil—for lubricating, rope batching, carriers' and fellmongers' uses.
2. Mineral spirit—three descriptions—gasolene, benzoline, and benzine.
3. Crude petroleum or liquid fuel, or, as it is termed in Russia, *astaki*.

For domestic use—three descriptions of lamp oil—American ordinary, water white, and Russian.

For medicinal use—American and Russian deodorised, solid paraffin, and vaseline.

We will take them in the order given.

1. Mineral oil for lubricating. Oils of pale straw to amber colour, ranging in s.g. from 0·805 to 0·925; the former used principally for high speed, light machinery, such as ring spindles, sewing, and drilling machines, planing and slotting machines; whilst the higher gravities are specially adapted for shafting, driving, and

carding machines—in fact, these oils, from the lighter to the heavier bodied, form the basis of all successful lubricants.

The intricate mechanism of the tiniest watch on “my lady’s” wrist, and the gigantic engines in our cotton and woollen mills, our electric lighting machinery, the mammoth marine engines which propel our mighty men of war and our Atlantic greyhounds—the Lucania and Campania—are all indebted to petroleum oil for safe and economical working—in fact, I might say, its high viscosity, flash point, and fire-test control the very heart beats of the engines which propel our merchant-men and navy across the mighty deep, our locomotive engines across the country, and the engines which form the motive power for the cotton mills and workshops of this England of ours.

ROPE MAKING.

In former years it was customary to soak the strands used in making rope and twine for fishing nets, sailing vessels, and all out-door purposes involving exposure to the weather and the action of the water, in animal and vegetable oils, to render them waterproof and less subject to deterioration. Mineral oil of gravity 0·875 has almost entirely superseded the oils before mentioned, being much more economical, less costly, and far superior in its action.

It has almost entirely superseded cod oil, seal oil, and rape oil in many of our large tanneries for the treatment of leather used for the manufacture of strapping, driving belts, and boots and shoes.

MINERAL SPIRIT—GASOLENE.

As I have previously indicated, it is now being extensively used for improving the illuminating power of coal gas. This is a mobile, almost colourless liquid, and possesses a very strong gaseous odour. It is extremely highly inflammable, and when exposed to the air generates vapour that is much heavier, and it is this feature that makes it extremely dangerous to use this liquid, as the vapour may flow over the floor unperceived until it comes in contact with fire, when it immediately ignites, and it will thus readily be seen that it cannot safely be used unless the most careful precautions against the escape of vapour be observed. I have previously mentioned that besides being used for increasing the illuminating power of coal gas it is also used for creating gas such as is used in our railway carriages, and with which, no doubt, most of us are familiar, and recognise by the name of Pope’s Gas Lighting Patent.

Benzoline and benzine resemble gasolene in appearance, but are less volatile—they do not so readily pass into vapour—but whilst there is, however, less danger from this source, there is greater liability to explosion. The former is largely used as a solvent for indiarubber, and to its introduction we are indebted for our macintoshes and waterproof clothing, as prior to its discovery it was not possible, except by an expensive method, which prohibited its use, to liquidise indiarubber and make it possible to amalgamate it with textile fabrics in the form with which we are now so familiar. The latter is largely used in dyeing and cleaning textile fabrics, especially where the extraction of grease is a desirable object to attain, and in the mixture of aniline dyes it has of late years become a valuable adjunct.

PETROLEUM RESIDUUM, OR ASTAKI, AS LIQUID FUEL.

After distillation and fractional distillation necessary for the production of the various liquids previously referred to, a residuum is left, which, as I have previously intimated, is called in America Petroleum Coke, and in Russia “astaki.” It contains

all the heavy hydrocarbons capable of creating heat, and the high temperature to which it has been subjected during the process of distillation having freed it from all volatile and dangerous liquids makes it admirably suitable for liquid fuel and also guarantees its absolute safety. A match or other naked light is immediately extinguished when plunged into it.

In some of the petroleum distilleries, most especially in Russia, *astaki* is used as liquid fuel under one still immediately after being run out of the other, which clearly demonstrates that even at a high temperature it may be burned with absolute safety.

During the coal strike of 1893 liquid fuel as a substitute for coal in generating steam, as well as for cooking and warming purposes, was widely advocated, and even now in more senses than one it may be considered a burning question.

Gas is made from oil for many purposes. The gas used in Pintch's system for lighting buoys at sea, and also in Pope's system for lighting railway carriages, is made by passing the vapour of petroleum through a retort, heated to redness, where it is partially decomposed, and a permanent gas is thus produced, having an illuminating power of about 40 candles. This gas is compressed to about 6 or 7 atmospheres, which enables a sufficient quantity to be stored in the luggage van to light the train for hours; and in the case of lighted buoys at sea, a sufficient quantity is stored to keep a light burning constantly for several weeks.

This subject is such an extensive one that a whole evening might very profitably be spent on its consideration alone, and I can but simply glance at a few of the leading features. I ask your attention to the subject in its application to steam boilers—locomotive, marine, and stationary—and to some of the advantages likely to accrue from its adoption. Before considering, however, the benefits to be derived by its adoption some few remarks as to supply and cost I doubt not will be of interest. At present no oil territories which approach the American or Russian oil fields in magnitude are worked, and how far such enormous quantities will ever be found it is difficult to estimate. All that can be said is that several places in different parts of the world present indications (and quite as good as those of Russia and America) of the presence of oil. Nothing but actual boring can give full certainty about the importance of any particular oil field, and even boring of a very limited number of holes, which may have proved to be very dry holes, is not absolutely conclusive. Take, for instance, McKean County in America. The Government reports of well boring point conclusively to the fact that in the earlier stages of the industry in this county the average results were anything but satisfactory, something like 75 per cent. of the wells bored proving, as they are locally termed, "dry holes": yet within a few yards of the most barren well that has been drilled the famous Drake well was sunk, and to-day the Proven oil territory, Bradford district, is 100 square miles—in the Limestone district 6 square miles, in the Big Shanty district $3\frac{1}{2}$ square miles, or a total for the county of 108 square miles. In the Cole Creek district, which has since been proved the most prolific, drilling operations were suspended after some twenty holes had been bored. An attempt was again made in 1879, and in the ensuing twelve months there was an increase in production from 168 barrels in April, 1879, to 3,753 barrels in the corresponding month of the subsequent year, and this has kept steadily increasing from year to year until a total of some 20,000 barrels or 800,000 gallons are produced every month in this district.

The Russian field also furnishes us a good example in this direction. The first borings were made at a place called Surachaney, where the escaping gases seemed to indicate a probable presence of oil, but the borings yielded none or but very little, whereas the Sabuntchy fields have produced the enormous fountains, the magnitude of which has astonished the world, and it is there that the principal wells are now in full exploitation, almost side by side with the Surachaney fields.

In regard to other sources of supply, the later years have seen important developments in the oil industry carried on in Burmah, Galicia, Sumatra, Java, Japan, Peru, and India.

At some of these places the oil is of s.g. and quality similar to that of America, and produces but a small percentage of oil available for fuel, but in others, notably Galicia, Java, and Peru, it is heavier and similar to that of Russia, and in Peru it has been adopted as liquid fuel by several railway companies, and some steamships are also run by it.

The general advantages accruing from the use of petroleum to any boiler, whether stationary, locomotive, or marine, are briefly these :—

It can be adapted to any boiler without material change in construction ; in fact, coal and oil may be burned alternately or together. The bars only require to be covered with thin slabs or cinders to prevent the oil from running through and being wasted. The furnace door requires to be provided with a hole for introducing the disseminator, and a steam and oil pipe have to be connected respectively with the oil tank and boiler. The disseminator or pulverisator in Russia is called a "fusunka," and consists simply of two half-inch pipes flattened at the end by a blow of the hammer, one leading the oil from the tank wherein it is stored, and the other conveying the steam from the boiler, running parallel with each other, the steam jet catching the out-flowing oil and forming a spray, which, when ignited, diffuses the flame over the firebox and prevents local heating of the boiler plates. This pulverisator gives entire satisfaction ; the flame is powerful and bright, and not a drop of oil is wasted when once ignited.

Its steam generating power is fifty to sixty per cent more than that of coal.

The fire can be lighted instantaneously, and is absolutely free from smoke and ashes. The frequent opening of the furnace doors can be avoided, thus saving heat, and preventing leakages of tubes, due to currents of cold air.

Rapidity of raising steam, and complete control over the fire are secured, thus avoiding waste of steam by the safety valves, and the boiler pressure can be regulated better than in the case of coal firing.

After mentioning these general advantages as applied to stationary engines, a few words may be said as to the special advantages accruing to locomotives and marine engine firing. As to locomotives : The valuable spaces at railway stations, which have now to be sacrificed for accommodatory coal supply, could be reduced by two-thirds, as only half the tonnage would be required to be kept in stock, and this quantity can be stored more economically in point of space than the same quantity of coal. A considerable amount of labour employed in storing coal and loading tenders would be saved, and the oil taken in simultaneously with the water supply—as quickly and in like manner. The avoidance of smoke and blowing of safety valves will greatly add to the comfort of the passengers, and is a boon to be conferred on the travelling public, for which the railway companies are prepared to make considerable sacrifices.

The work of the stoker is reduced, so far as firing goes, to simply giving the regulator a turn from time to time, and the absence of dirt and smoke makes the service less disagreeable than coal firing.

For steamships, in addition to the various advantages accruing, as before mentioned, to stationary and locomotive boilers (which are also equally applicable to marine), the use of liquid fuel is of still greater importance. Much valuable space which has now to be sacrificed to coal bunkers can be saved. The oil can be stored in the ballast tanks at the bottom of the boats, and will add very materially to its stability. As the oil is consumed it can be replaced by water without in the least

damaging the fuel, as the oil being lighter in density than the water would rise to the surface. Its anti-corrosive properties would prevent corrosion in the tanks, and secure an economy in the shape of preventing the necessity and expense of constantly having to repair or replace the water ballast tanks as at present, thus retaining the ballast tanks in normal condition. The stoke-hold can be considerably reduced, less attention will be required, the intense strain upon the stokers caused by exposure to the heat with continual firing will be avoided, and by automatic firing the number of stokers required will be reduced by 50 per cent.

The dangers of fire in coal bunkers will not be replaced by any similar danger from oil. Overheating, sweating, and consequently ignition as in coal storages are not applicable to storage of oil.

In stormy weather causing a great inrush of water into the stoke-hold and consequent extinguishing of fires, they can be instantly relighted, and the danger of scalding (by which many a stoker has lost his life) reduced to a minimum.

Further, in *extremis*, a ship having oil at its disposal, can by pumping a quantity overboard avoid much trouble and weather many a storm.

WAR.

Experiments have also been made as to using liquid fuel in time of war. Geographically speaking, there are advantages and disadvantages. The question of coaling our fleets, in the event of a blockade being attempted, would prove a very serious one. Again, supposing we had such an alliance as Russia and America against us, liquid fuel would then be of small importance, as the two producing countries would stop supplies. Still, as I have previously indicated, several British possessions, I believe, contain vast storages of petroleum, and are capable of supplying English requirements if properly developed. And granted that it can be utilised, as I submit it can, we should then have two classes of fuel, whereas we have now only one; and in the event of difficulty of transport, or procurement of the one, we should be able to fall back upon the other.

Questions have been raised as to its safety. In the case of its application in a heated state to stills in Russia I think I have clearly demonstrated that it is absolutely safe under intense heat, as when run out of the stills it ranges from 300° to 320° Cent., or 636° to 704° Fahr.

By permission of the Admiralty I had the privilege of witnessing several experiments at the Dockyards at Portsmouth. An old hulk was filled with petroleum oil (not crude), from which all spirit had been extracted, and a red hot shell was fired into it; another and another were fired in rapid succession without injury, save and except that caused by leakage. The oil extracting the heat from the shells, they fell harmless into the tanks.

At the same time experiments were made with a view to utilising liquid fuel for torpedo boats. Here again it proved itself eminently suitable; the entire absence of smoke prevented detection at less than one half the distance of that propelled by coal firing, and the raising of steam was successfully accomplished in almost one-half the time. Here the question of store space presented itself, and it will be readily understood that in so small a craft it is of the utmost importance that every inch of room that can be spared shall be utilised.

Lastly, in the case of large industries carried on in thickly populated centres, I claim for the use of liquid fuel the following advantages:—

The dispensing with unsightly high mill chimneys, as, granted free admission of air to the furnaces, no flame or smoke enters the chimney, which will only require to be very short, or of sufficient height to create draught.

A considerable reduction in the discomfort caused by fogs or vitiated atmosphere, as, if the apparatus for burning be properly constructed, absolutely no odour is evolved or smoke created. I apprehend some of you will scarcely agree with my foregoing statement, and will be ready with a question somewhat of this description. "How is it that during the coal strike of 1893, when oil burning apparatuses were brought out by several Manchester machinists and used by several Manchester coal consumers, they were discontinued, and that one of the greatest objections raised was directly opposite to your statement, namely, that they caused intense black smoke?" In the first place I should answer a question of that kind in this wise: (1) The apparatus was defective. (2) The oil burned was not petroleum residuum or astaki; it was a mixture of creasote oil and tar, which is known to give off intense smoke on ignition. I apprehend that had petroleum residuum been accessible in sufficient quantities in this district, and had we been able to import shiploads ready for use at convenient carting distance, the question of liquid fuel would have agitated the minds of our large coal consumers much more than it has yet done, and greater advances would have been made towards its adoption. I await with interest the awakening of the minds of consumers to the fact that it is practicable; after that I am confident its adoption is only a matter of time, as the cost, cleanliness, health, and economy are all in its favour.

DOMESTIC USES.

I will now ask your attention for a short time to its application for domestic use.

In Russia astaki is used in some cases for domestic use in warming and cooking stoves. The arrangement is as follows: A tank is placed on the top of the house, and a system of $\frac{1}{2}$ inch pipe conveys the oil to the different stoves, where it is allowed to drip on a small disc or plate placed in front of the stove door. The said door is provided with a small opening for the purpose of creating a strong draught. When once the plate is warm and the dripping of the oil properly regulated, it burns without further attention. The consumption, however, in this form is as yet insignificant, but may be mentioned as showing a possibility of greater developments in the system of using it for this purpose.

It is, however, more especially the three descriptions of petroleum oil previously mentioned, namely, American ordinary, Russian, and American water white, with which most of us are familiar, to which I desire to draw your attention as applied to domestic uses. American water white is colourless. Russian oil has a pale straw colour: whilst the ordinary American oil is somewhat darker. The fire tests of these are 140° , 130° , and 120° respectively. I would here mention that the higher the test the safer the oil.

The object of the refiner ought to be to eliminate from the oil the most inflammable constituents; but inasmuch as the difference in price obtainable for the spirits before mentioned, over and above that of oil, is so small, unprincipled refiners did not do this, and in many instances accidents were the result.

This led to the passing of the Petroleum Act, which now requires that petroleum oil shall not be imported into or exposed for sale in this country which gives off an ignitable vapour below a temperature of 73° Fahr., when tested in an apparatus devised by Sir Frederick Abel. I cannot here enter into an argument as to which I consider best, the test devised by Sir F. Abel, or that of Dr. Redwood, named respectively the open and closed test. Nor can I pass an opinion in face of the conflicting evidence before the House of Lords Committee Inquiry into the working of the petroleum industry, 1883, as to whether 73° Fahr. is a sufficiently high test to embody perfect safety. Suffice it to say, that I am surprised that in an inquiry of this description, and having regard to the safety of human lives, only eighteen

witnesses were examined—thirteen of whom were connected with the petroleum trade, one in the paraffin trade, and four neutral—and it strikes me as being at variance with ordinary experience and common sense to expect a true verdict as to what is a safe standard test, when the interested trades preponderate to such an extent, and evidence for the benefit of the general public cannot be looked for.

The Parliamentary Committee of 1894 appointed to consider the whole question of inflammable oils had scarcely commenced sitting, and in point of fact had only examined two witnesses, before an arrangement between the Standard Oil Company and the Scotch companies was contemplated, and one of the terms of agreement laid down by the former was that the latter take no part in the flash point agitation. (I make this statement on the authority of Mr. Young, of Scotch shale oil fame.) This serves to show the power wielded by the American company. The reputation which this company enjoys is forcibly put in "Wealth against Commonwealth," by Henry D. Lloyd, New York; publishers, Harper Brothers; to which I refer you. He says:—

"Independent producers are shut out from all the main markets, and freedom of trade in an article of daily use has ceased to exist."

I have culled this extract merely to demonstrate to you that out of the eighteen witnesses called before the committee to agree as to a verdict on the safety or otherwise of a 73° Fahr. test, thirteen were either servants, or merchants, or experts, directly or indirectly connected with this gigantic monopoly, whose one object is to sell indiscriminately in this country an oil of flash point lower than that permitted to be sold in most of the States of America; and to submit that if there is a doubt as to the safety of this test, then let us by all means have an independent inquiry, and if the flash point is too low, raise the standard. It will not interfere with the trade; we are getting educated to the uses of petroleum, and the safer the oil the quicker the education will be accomplished.

It is impossible for me in an address of this description whose subject is so general to trace the oil lamp from its primitive state to the most modern one, and I therefore ask your attention to a few of the chief characteristics of the latter.

The function of the chimney is to furnish the flame with an adequate supply of air and thus bring about complete combustion of the oil. As soon as the chimney becomes heated, the air in contact with the inner surface becomes lighter than the surrounding air; hence it ascends and rapidly passes out at the top of the chimney, its place being taken by an inrush at the base.

A current is thus established, and the strength of the flow of oil is dependent upon the length of the chimney, and it is extremely advisable that due regard be paid to the size of the burner, and well proportioned and close fitting chimney. For instance, were I to shorten the chimney of a lamp the brilliancy of the flame is diminished, and smoke is freely emitted.

The raising of the oil by means of the wick is by what is generally termed capillary attraction, the force of which causes a liquid to ascend through a narrow channel when in close contact with the fibres of cotton.

The first step in the construction of an oil lamp is therefore the enclosing of the wick in a tube extending from the larger vessel to the burner. The volatility of the oil renders it necessary that the vessel should be covered.

Several articles have been used in the manufacture of oil vessels, or receptacles, notably, glass, china, brass, iron, and papiermaché. The latter, however, has been dis-

continued, being found in practice inferior for use to what it seemed in theory. The vessels which obtain the most favour, however, are brass and iron, the former more especially, where the initiative cost is not so much a matter of consideration, and the latter where use is preferred to elegance and costliness. My opinion, gained by close observation of results of inquests on petroleum lamp fatalities, is this, that were the manufacture of cheap (rather than serviceable) lamps with common ill-fitting burners and fragile receptacles of glass and pot to be made a criminal offence (unless they were to be subjected to a test for strength), many of the so-called lamp explosions would not occur; for I maintain—and my position is sustained by the report of Mr. Alfred Spencer, of the London County Council—that 80 per cent of the lamp accidents are caused by defective burners, and the breakage of glass and pot vessels, which would be minimised if not altogether done away with by the use of good fitting burners, and brass and iron vessels; and this I contend would do more to ensure absolute safety in petroleum oil consumption than the raising of the standard tests or fifty parliamentary committees.

I am not interested in the sale of burners or lamps, and therefore in recommending one and leaving out the other I am not guided by any sinister motive. I can confidently, without entering into detail, recommend for perfection of combustion, the Duplex, manufactured by Messrs. Wright and Butler, of Birmingham, with patent lighter and extinguisher without removal of glass; the "Kosmos," and the Lampe Nationale, manufactured by Messrs. Lewtas, of Cornbrook Lamp Works; the Lampe Belge and the Royal, made by Messrs. Johnson, Clapham, and Morris.

It is desirable in burning petroleum oil to have the level of the oil at a greater distance from the flame than would be the case in colza, seal, or other inflammable and heavier bodied oils, and, on account of its lighter body, increased speed of flow, greater heat, liability to generation of explosive gas; and this is amply provided for in the lamps before referred to, without increasing the distance so materially as to interfere with the flow of oil and the diminishing of the light, as the receptacle gradually becomes empty; this is an objectionable feature in some of the lamps on the market.

Another important feature to which I would draw your attention is the selection of the wick, and the care to be exercised in using it. It should be lightly woven, soft, and of even texture, and should be of such a size as to comfortably fit the tube without being compressed into it. Before applying a new wick it should be thoroughly dried, and it is advisable to exercise care in satisfying yourself, from time to time, that it has not become liable to congestion, owing to accumulation of dirt from the surface incrustations having become deposited in the oil by the turning down of the wick or other causes.

In extinguishing a lamp that is not supplied with a mechanical contrivance for the purpose, the wick should always be lowered until only a flicker of the light is visible, and a short puff of the breath directed across the chimney. The dangerous practice of blowing down a chimney cannot be too highly condemned, as not only does the current of air so administered cause the gas to rush out of the holder up the chimney, its only means of escape, but it forces the flame down to meet it, and many accidents have been traced to this source.

In trimming the wick it is not necessary to use scissors, or other sharp instrument; all that is necessary is to remove the charred portions by the use of a little waste paper or cloth.

The oil reservoir should always be full or nearly so on lighting, and care should be exercised to remove all traces of oil from the outside of the reservoir, as on

becoming heated it is likely to evolve a disagreeable odour, which is often, by those uninitiated, charged to the inferior quality of the oil, whereas it is only a want of attention to cleanliness.

The burner should be periodically rinsed with soap and warm water to remove any charred fragments that may have fallen from the wick and clogged the air passages, as without perfect admission of air it is impossible to secure perfect combustion.

Should it, however, through some defect in the construction of the lamp, or neglect of the foregoing conditions necessary to the safe working of a petroleum lamp, fall to your lot to have a lamp on fire, as it is generally termed, if it be constructed with a metallic vessel there need be no cause for alarm; simply wrap it in a cloth and carry it out into the yard or garden, and it will burn in safety. Do not on any account attempt to extinguish with water; soil is preferable.

It will, no doubt, before I pass on to the commercial aspect of the question, be interesting to compare the relative cost of lighting with oil and gas.

Coal gas yields light equal to 2·6 candles per foot, therefore 1,000 cubic feet of gas would give the light of one candle for 2,600 hours, or 10 candles for 260 hours.

The average consumption of oil may be fairly taken at 50 grains per candle light per hour, or a cost of one candle light for 2,600 hours at 1s. 6½d., if the oil were purchased at 8d. per gallon. It is therefore clear that, with the present prices of gas, oil is the source of a given quantity of light at about half the cost of gas.

During the past few years there has been a remarkable increase in the use of oil stoves for heating dwellings, conservatories, etc.; time forbids me, however, dwelling on this interesting feature of petroleum oil consumption. I have, however, compiled the result of several tests made at the International Health Exhibition, 1884, and corroborated by my own experiments, to which I ask the attention of those of my hearers interested at the close.

REPORT OF TESTS OF FIVE PETROLEUM OIL STOVES, AND COST PER HOUR.
OIL, 8D. PER GALLON.

Cooking Stoves.	Size of Wick.	Quantity Consumed per Hour. Fluid Ounces.	Temperature of Oven 15 Minutes after Lighting.	Total Cost per Hour.
No. 1	2 6in. wicks	12·63 ounces	530° Fahr.	Three-fifths of 1d. Fraction over ½d.
No. 2	4 2½in. wicks	10·4 „	350° Fahr.	
Heating or Warming Stoves.				
No. 3	2 4in. wicks	8·15 „	—	Fraction over ½d.
No. 4	1 4¾in. wicks	2·69 „	—	Fraction over one-eighth of 1d.
No. 5	1 2¾in. wicks	2·48 „	—	One-eighth of 1d.

Further, I can only briefly mention such important uses as the displacing of animal and vegetable oils in the manufacture of jute and rope.

The manufacture of petroleum spirit, the only successful solvent for indiarubber, makes it now possible to procure a liquid indiarubber, to which we are indebted for our macintoshes and waterproof clothing.

Paraffin Scales, to which we are indebted for our wax candles, matches, tapers, etc.

Paraffin Wax, having a melting point from 116° to 132° Fahr., used in all the varieties of waxed paper, butter paper, coverings for jams, etc. It is used not only for keeping moisture out but for keeping it in, as in wrapping bundles of cigars, packages of tea, etc., and is rapidly replacing tinfoil for these and kindred purposes. It is also used for protective coatings; it entirely resists chemical action, and can be successfully used for coating mineral water, vinegar, alcohol, white wine and liquor barrels, oyster buckets, and white lead packages. One of the latest and most interesting discoveries is its adaptability for the coating of butter firkins, preventing the woody flavour produced by the old system of package, and minimising the evaporation of the water from the butter.

Eggs dipped in a weak solution of paraffin wax retain their freshness for years, as the pores of the shell, being hermetically sealed, prevent decomposition.

Experts in search of waterproof coverings for explosives, dynamite and powder manufacturers have discovered in paraffin wax just the article desired.

Paraffin wax is used in cutlery manufacture as a hardening tallow for polishing handles of knives and forks.

Wooden cog wheels are dipped in melted wax to give them smoothness and durability.

Manufacturers of fly papers use it to a considerable extent; electrical works use it in covering bottoms of vessels; canneries for covering jellies; worsted mills to keep the warp smooth in the looms; cotton mills to thicken the starch for cop bottoms; confectioners for caramels and candies, and for the manufacture of the boys' delight—chewing gum; iron foundries for greasing moulds; tanneries for dressing leather; honeycombs are made of it ready for the bees to fill, and for modelling of faces, fruits, and flowers it is indispensable.

This material is also in great request in the laundry for finishing purposes, adding gloss to the linen, and greatly assisting in the ironing, stiffening, and polishing.

COMMERCIAL.

I will now ask your attention to the commercial side of the question. Here I would say that in 1875 the Czar of Russia granted a concession to one Richard Nobel, a Parisian chemist, to exploit for oil in Surachaney fields, in the Baku district. I am not in possession of any authentic details as to the production of the wells for the first year. Transport difficulties presented themselves, which, to a man of anything but iron will, would have seemed insurmountable, and it may come as a surprise to you to learn that the first products of these now famous wells—a distance of 350 miles from Batoum—had to be carried in skins of an average weight of 85lbs. each on the backs of hired transports through a totally barren district devoid of roads and accommodation; and owing to the hostility of tribesmen, watch towers had to be erected and manned by soldiers to cover the approach and departure of transports.

In 1877, two years afterwards, a pipe line, or drain, if you like, was laid down, through which the oil was thrust by its own natural force until it had spent itself; whence, having been pumped at several intervals to the highest point *en route*, it flowed down to the seaboard at Batoum, where gigantic reservoirs had been constructed to receive and store it.

These reservoirs were constructed in the first instance to hold twenty million gallons: they have since been enlarged and new ones constructed capable of storing 500,000,000 of gallons.

The first authentic record gives the production as 2,455,000 barrels in 1880. In 1893 the total production was 33,104,126 barrels, or 1,390,373,292 gallons.

You will please observe in my statistics later I refer to 1891 production, as I have only just become possessed of the returns for 1893. I mention this so that my figures may not be misunderstood.

The short space of time allotted me prevents my enlarging upon the difficulties encountered and overcome in the laying of this pipe line. Suffice it to say that it served its purpose until 1883, when a railway was opened from Baku to Batoum, and in addition to the using of the pipe line, which had been found inadequate to cope with the demand for oil for shipment, the firm of Nobel Bros. (which had then been consolidated by the entry into partnership of a wealthy brother, Richard Nobel), who at first characterised the undertaking as a mad enterprise, commenced running two trains per day, composed of 30 tank wagons, each having a capacity of 2,000 gallons, or 120,000 gallons per day in transit (since that time the capacity of the tank wagon has been increased to 25,000 gallons each); additional trains have been put on, and only last week I read that another pipe line is being laid alongside the railway line at a cost of nine million roubles.

Owing to this vast increase in trade, Baku (the capital of the company so named) has risen from a comparatively small village in 1880, to a city of 40,000 inhabitants in 1890, with fine mosques, bazaars, rows of elegant houses, and a fine esplanade, all in the space of ten years.

Batoum, which up to 1878 belonged to Turkey, and was ceded to Russia by the Berlin Treaty, from a port of small dimensions, protected by a tongue of land on the west, and open to the east-north-east and west, has been considerably improved and enlarged, making it now possible for vessels of the largest draft to enter and approach within a few feet of the shore, and has become not only the most important, but the safest port on the eastern coast of the Black Sea, and has increased in population from 5,000 inhabitants in 1878 to 75,000 in 1890.

From this port there is an average weekly sailing of 18 tank vessels, having a capacity of 40,000 to 50,000 gallons each, destined for almost all the important ports of the world, but chiefly those of England, India, and Australia. Add to this, oil shipped by coasting steamers and trading vessels for Black Sea ports—such as Odessa, Tamail, and Varna—for distribution over the Bucharest railway, and by the Danube to Galatz and inland towns of Austro-Hungary; Turkish ports, such as Constantinople, and Gallipoli on the Sea of Marmora; the various ports of Greece and the Grecian Archipelago; and the vast quantities sent overland by trunk railways right into the heart of Russia—not to mention ports on the Caspian Sea—we have a total output of about 15,400,000 gallons per week. Out of this quantity Japan, a country in which we are all somewhat interested at the present moment, consumed 33,228,500 gallons last year; and, as indicating the growth of civilisation in that country, I may mention that this consumption is increasing at the rate of about 1,000 per cent per annum. This fact, coupled with the removal of the restriction placed against vessels passing through the Suez Canal, doing away with the necessity of going round the Cape, shortening the sea voyage and reducing freights, augurs well for an even still greater increase in the export of petroleum oil than even that witnessed during the last ten years, and bids fair towards enabling Russian oil to successfully compete with, and even outstrip, her American competitors.

AMERICA.

Were I to make an attempt to give even a faint outline of the enormous development of the petroleum oil trade in America, I should be compelled to ask our chairman to extend the time allotted me until the small hours of to-morrow morning, and I am afraid that even then I should but have exhausted your patience, and only

touched the outline of the history. The records of the successes as well as of the failures, of the fortunes won and lost, would fill the now almost obsolete three-volumed novel, which would be as interesting and as full of romance as the stories of the rush for the Diamond Fields and the gold fever of Australia. Permit me, however, to say that cities, with their banks, stores, hotels, newspapers, etc., have been the creation of a very short space of time, namely Oil City, Pithole City, Corresville, Rousville, and Plummer Cities were all formed in the space of three years.

In September, 1875, when the first authentic account that I have been able to secure was published, namely "Stowell's Petroleum Reporter," the daily average production was given as 150 barrels in the Bradford oil district; and as this was, and is still, the greatest producing district, I am compelled to use this as an illustration.

The total production for that month was 4,500 barrels. In the corresponding month of the following year the daily production was 47 to 790 barrels; in September, 1877, 148 to 230 barrels; in September, 1878, 660,000 barrels; in September, 1880, 1,780,000 barrels; and the increase had been maintained *pro ratu* up to the last authentic report that I have received, namely, that for 1893, when the total production of the oil-producing States of America is given in the Government records as 1,681,600,000 gallons per year, or say 5,300,000 gallons per day; or, to place the record in barrels as previously given—to contrast with the production of 1880—a monthly record of production of 3,920,000 barrels per month in 1893, against 1,780,000 barrels in 1880, or a 40-gallon barrel of petroleum oil every two-thirds of a second throughout the year, calculating both day and night.

The prices at the wells in 1875 was \$1 33c., or about 5s. 6d. per gallon in English money; in 1887 it reached the highest point on record, namely, \$3 75c., or about 15s. 6d. per gallon.

The price gradually declined 75c., or about 3s. 1d., in May, 1879. A gradual advance took place from that time, until it reached \$1 10½c. in January, 1880, since which time it may be said to have been gradually declining, until the official report of 1893 gives the value at the wells as about 4c., or about 2d. per gallon.

TOTAL COMMERCIAL VALUE.

Thus, taking a production of 1,680,000,000 gallons per year, we have a total commercial value in America of £14,000,000 per year. Add to this the total yearly production of the Russian wells of 770,000,000 gallons, representing a value of £6,400,000, and that of the Galician wells (which time has prevented my referring to) of 50,000 to 60,000 gallons per year, and the total production of the three most important centres is 2,450,000,000 gallons per year, or a commercial value at the points of production at 1893 prices of about £21,000,000 sterling; or taking the time it leaves the wells (and assuming that the ruling price in all the consuming centres is about par with that of England), the consumer pays over £50,000,000 per year for petroleum oil.

These figures are for 1890. In 1893 the total production was 3,541,893,978 gallons, or, reckoned on the same basis, a commercial value of, roughly speaking, £70,000,000 per year.

This vast industry employs several thousand hands, 15,000 steamers, 200 sailing vessels, 15,000 miles of pipe lines of an average diameter of 4ft., thousands of railway wagons, barges, flats, horses, etc. There are 43,000 hands employed at the wells in America, and 10,503 hands at those in Russia.

In England alone there are over 500 horses and wagons; or taking Great Britain, where the consumption of petroleum oil in 1889 was over 90,000,000 gallons, or close upon three gallons per head of the population per annum—246,575 gallons

per day, 10,274 gallons per hour—close upon 1,000 horses and over 2,000 railway and other wagons in use daily distributing the oil.

Its commercial value, however, cannot be fully estimated by what is actually received at the wells, or as the point of consumption for petroleum oil. By its distillation we obtain the products previously mentioned, such as mineral lubricating oils, ranging in prices from 5d. to 1s. per gallon; benzoline, 7d. to 8d. per gallon; benzine, 6½d. to 7½d.; paraffin wax at 2½d. to 3d. per lb.; paraffin scale, £2 to £5 per ton; gasolene, etc., and calculating the percentages of these products obtainable, I gather that the total commercial value of petroleum oil and its products cannot be much less than £70,000,000 to £80,000,000 per year.

MEDICINAL.

I am not sure but that there may be amongst my audience some medical gentleman who might be disposed to question my right (not being a member of the profession myself) to offer an opinion as to its medicinal qualities. However, whether that be the case or no, it is not my intention to prescribe it, either in one form or another. I intend simply to state the uses for which it is employed.

Homœopathically in a concentrated form as a specific for sea-sickness; nausea of the stomach; obstinate skin diseases; for croup and disorders of the chest and lungs, and rheumatism.

OINTMENTS.

As a basis for an ointment for wounds, sores, and swellings, it is almost invaluable, and in the form of vaseline, which is totally a petroleum product, most of us will no doubt be familiar.

Its properties are stated to be such, that it is the only article that will cause the hair to grow on bald heads and bare patches. Here, Mr. Chairman, I can only give the theory, practice, so far as I am personally concerned, has not yet proved its efficacy.

In conclusion, I am perfectly confident that although during the last few years the trade has grown to such gigantic dimensions, it is only as yet in its infancy.

Experiments are being made constantly and are proving its efficacy for use in science, art, and even in agriculture, it being one of the best known exterminators of such pests as green fly, red thrip, caterpillar, and potato blight, and in the mechanical world, such as I have indicated.

For use as fuel, the chief objection in the past has been the cost, but when I mention that in thirty years it has fallen from 15s. per gallon to 8d. per gallon, and in order to compete successfully with coal produced at your own door, it has only to fall another ½d. per gallon, I consider it within the range not only of possibilities but probable (with the new sources of supply being developed and improved methods of transit) that this will be the case in the near future. I am looking forward and anticipating this, also the erection of vast storage tanks at Mode Wheel, as indicated on the plans of the Ship Canal Company, by Manchester men with Manchester money, such as those erected at the Herculeum Dock, and West Float, Birkenhead, at the sister port at Liverpool, and which are earning a considerable revenue for the Mersey Dock and Harbour Board, for the distribution of the vast quantities of oil over the different railways, to most of the towns and villages of Lancashire and Yorkshire.

Taking one-half of the imports of petroleum and lubricating oils into Liverpool and giving it to Manchester, adding Canal and ship's dues, it would increase the revenue of the Manchester Ship Canal Company by £40,000 a year, and would materially assist in bringing about that anxiously looked for shareholders' meeting, when hopes long deferred will be realised and a dividend declared.

ANCIENT VOLCANOES OF GREAT BRITAIN.

(This interesting paper is copied from the *Standard*.)

IT might seem like a romance to talk of volcanoes in a country where Nature works so quietly as in our own, and even earthquake tremors are but seldom perceptible to the ordinary observer. Happily for us, the volcanoes are extinct. For many years past the principal facts in regard to the volcanic history of the British Islands have been subjects of investigation, and sometimes of controversy, among geologists, but now Sir A. Geikie has availed himself of the advantages which he enjoys, as Director General of the Geological Survey, to collect together the scattered information, and in his new book on the "Ancient Volcanoes of Great Britain" has told the tale with that literary grace for which he is so justly distinguished. From these two well-illustrated volumes we can gather not only a complete story of volcanic action in Britain, but also the record on which a belief in that story can be justified. Upon all its main outlines geologists are now agreed, though there are points about which controversy still exists, and one or two where some competent authorities will differ from Sir A. Geikie. These, however, are, comparatively speaking, details, and we must admit that on each of them there is evidently room for two opinions.

The chronicle of British volcanoes relates to a large portion, but not the whole, of our Islands, and it goes back to a very remote period in geological history. If we draw a line from Flamborough Head to Portland Bill, the district to the south-east of this has never, so far as we know, been disturbed by volcanic action. If it has, the evidence is hidden from view beneath more recent deposits. But in that larger region to the north-west, though, of course, some districts have escaped, one must be prepared at any moment to come across masses of ancient lava or piles of volcanic ash; while certain districts must once have been veritable "lands of fire." The story begins very early, as we said, in geological history, in an era prior to the oldest rocks in which any certain records of living creatures have been found, at any rate in these Islands—the era to which geologists give the name of Archaean or Pre-Cambrian. The rocks which generally are assigned to the earlier ages in this era would lead us to suspect that eruptive action was common enough in those days, but the records are so defaced, and our knowledge of their language is still so imperfect, that it is wiser to say little and to pass on. But when we come nearly to the end of that era, the characters of Nature's picture-writing are clear, and in some districts we may confidently recognise the fragments of extinct volcanoes. They occur at Hartshill, in Warwickshire, beneath those hard sandstones which sometimes come to pave the streets of London, beneath similar sandstones at the Lickey Hills, by the ridges of the Malverns, Caradocs, and Longmynd; at the high crest of the Wrekin; perhaps in that part of Leicestershire which is now marked by the rugged hills of Charnwood Forest; in Pembrokeshire, near St. Davids; along the northern side of Carnarvonshire; and possibly in Anglesey. The exact date of some of these is one of the matters of dispute, but, at any rate, we may say that if they do not all belong to the close of the Pre-Cambrian era, to which Sir A. Geikie assigns some of them, the newest cannot well be later than the very beginning of the Cambrian. The materials ejected represent the more glassy types of volcanic products, those commonly designated trachytes and pitchstones, though certain changes, needless to particularise, since the time when they became cold, have obscured the resemblance to these rocks.

All geologists admit that the extinction of these scattered volcanoes was followed by a long interval of comparative if not universal calm. It was not till the beginning of the period called the Lower Silurian by the Survey, that another chapter really began in the history of British eruptions. The most important centre of these disturbances was Merionethshire. The rugged hills that sweep inland in a horseshoe from Tremadoc to Towy; Cader Idris, the Arrans, the Arenigs, to name no more, are carved out of huge masses of volcanic materials, which were ejected in the epoch

called Arenig, after the last-named summits. During this there were also severe eruptions in Shropshire, as may be seen in the district west of the Longmynd, and at the Breidden Hills on the Montgomeryshire border. Far away to the north was another group of volcanoes, remnants of which may still be seen on the Ayrshire coast, near Ballantrae, and to a less extent in one or two other localities, not only in the southern uplands of Scotland, but also in the Forfarshire Highlands. But volcanic activity did not end with the Arenig epoch. During its successor—the Llandeilo—there were several scattered vents at work in Wales along a line from the Breidden Hills to the mouth of the Taf river, the most important being at Builth, as well as near the Pembrokeshire coast from Abereddy Bay to Fishguard. But the great volcanic region at this epoch was in that now called the Lake District. All those wild hills, forming the zone which passes across the country between the head of Windermere and the foot of Derwentwater, have been carved from the lavas and piles of ash, coarse and fine, which were ejected during the Llandeilo time. The Lower Silurian period was also one of unrest in more than one part of Ireland, though at present the exact date cannot be fixed so nearly as in Britain. On the eastern side the volcanoes were larger and more numerous towards the south, as in Wicklow, Wexford, and Waterford. On the western side they were active in the region between Killary Harbour and the shore of Lough Mask.

In the Upper Silurian period they broke out also in Kerry, where the Dingle promontory juts out into the Atlantic. During this time all Britain seems to have reposed, unless some slight disturbance occurred at Tortworth, in Gloucestershire. But in the next geological period, the Old Red Sandstone or Devonian, the truce was broken. England was but little disturbed, though some volcanic discharges took place along a zone of country extending from Newton Abbot, by Plymouth, towards Penzance; Wales appears to have been at rest, the south of Ireland was not quite so peaceful, but Scotland now had its times of trouble. Volcanoes, though but few, were scattered in the basin of the Moray Firth, and even as far north as the Shetlands; they have left their memorials in the hills of Lorne; they crowned the heights of the southern uplands, and they raged on either side of the Firth of Forth. Cones and craters are gone, but the Pentland, the Ochil, and the Sidlaw ranges are fragments of volcanic groups, of which another and more southern cluster is marked by the Cheviots. But even the crystalline rocks of the Highlands are shattered by dykes or interrupted by bosses of ancient lava, which probably was ejected during this period. The volcanic activity slackened greatly, though it did not entirely cease, in the latter half of the Old Red Sandstone, but it was renewed, though with diminished intensity, during the Carboniferous period. Both early and late in this, sporadic volcanoes, often quite small, broke out in several parts of Scotland, more especially in the basin of the Firth of Forth. The peace was at an end in England. Early in the period there were eruptions on the sea bed, where now we find the hills of Derbyshire; and the traveller, as he is hurried in the Midland express above the crags of Miller's Dale, can see, in the glen below, one of these submarine lava-flows. Western Yorkshire was disturbed, so also was Devonshire, and there were outbreaks in King's County and the Limerick Basin, where, indeed, they had begun in the preceding period. In Scotland volcanic action lingered on into the next, or Permian, period; it was felt then, or a little earlier, in several parts of our Midland Counties, and (as is now commonly admitted) over a considerable area in the neighbourhood of Exeter.

The imprisoned Titans, to use the classic metaphor, were now exhausted. Myriads of years elapsed before they could brace themselves for another struggle, but when it came it was a fierce one. It began almost with the Tertiary era; it lasted through the Eocene and Miocene periods, closing, but, as before, with sporadic outbreaks, possibly so late as the earlier Pliocene. The volcanic region extended all along the west coast of Scotland into north-east Ireland. It reached even to remote St. Kilda on the one hand, and to Carlingford Lough on the other. There are two great groups of igneous rocks—namely, basalts, and their coarse-grained representatives, called gabbros, on the one hand; pitchstones, felstones, and granitoid rocks on the other. In regard to these, many points are still matters of controversy. Sir A. Geikie considers the second group as the newer, Professor Judd looks upon it as the older; but he this as it may, all geologists agree that the wildest scenery of the Western Isles—the Cuillin Hills of Skye, the basalt columns of Fingal's Cave and of the Giant's Causeway, the riven cliffs of Strathaird, and the crags of Mull—are all memorials of this long age of volcanicity.

PROCEEDINGS OF THE SOCIETY.

JANUARY 1ST TO SEPTEMBER 30TH, 1896.

The 366th Meeting of the Society was held at the Coal Exchange, on Saturday, January 4th, 1896.

The Victorians again invited the younger children of the members to an evening party, and the invitation was responded to by a large number.

At five o'clock the children were received by the Victorians and entertained with lantern exhibitions, games, conjuring feats, etc. During the evening, Lady Leech cut and distributed the Christmas cake presented by a lady member.

The prizes for the best replies to the questions asked in *Geography* were adjudicated, and the prizes were handed to the winners by Lady Leech.

Very hearty thanks were given to Lady Leech, to Miss Carrie Moore and her friends, to the Misses Williamson, Mrs. Richmond, Mrs. Wilde, Mrs. Sowerbutts, Mr. G. A. Irlam, the Victorians, and all others who had assisted to amuse the children.

The 367th Meeting of the Society was held in the Library, on Wednesday, January 8th, 1896, at 7-30 p.m. Mr. S. OGDEN, J.P., in the chair.

The Rev. ALLAN SPENCER addressed the members on "Life in South Africa." The address was illustrated with lantern views, maps, and an interesting collection of native curiosities belonging to Mr. Spencer.

Mr. STUART, who has resided in South Africa, addressed the Society, expressing his thanks to Mr. Spencer for his address.

The Chevalier FROEHLICH moved, and Mr. STUART seconded, a very hearty vote of thanks to Mr. Spencer, to which he responded.

On the motion of Mr. A. Y. SCHOLFIELD, Mr. Ogden was thanked for occupying the chair, and he briefly replied.

The 368th Meeting of the Society was held in the Library, on Wednesday, January 15th, 1896, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

The minutes of the meetings held on December 23rd (364), 27th (365), January 4th (366), 7th (367) were read and approved.

Communications and reports were read and commented upon.

Mr. F. C. SMITH, F.R.G.S., F.L.S. (Simisi), of Corpus Christi College, Cambridge, addressed the Society on "Uganda." (See page 65.) The address was illustrated with lantern views, and Mr. Smith exhibited a collection of drawings of Uganda birds and a large number of photographs.

Very hearty thanks were given to Mr. Smith for his address and for his replies to a number of questions on the subject.

The 369th Meeting of the Society was held in the Library, on Monday, January 20th, 1896, at 7-30 p.m. Mr. J. D. WILDE in the chair.

The minutes of the 368th Meeting were read and approved, and the election of the following members was announced:—

ORDINARY: MESSRS. John A. Billington, W. G. Booth, Alderman I. Bowes, Anthony Burgon, J. T. Doyle (Vice-Consul for the United States), James Forrest, Thomas Harris, Charles Marx, Harry Sowler, Reuben Spencer, J.P., William Turner.

The Rev. THOMAS WAKEFIELD, F.R.G.S., addressed the members on "British East Africa." A large number of lantern views were exhibited, from photographs and drawings taken by himself and Mrs. Wakefield.

After considerable discussion, Mr. J. HOWARD REED proposed, Mr. G. JACOBY seconded, and Mr. G. LORD supported, a vote of thanks, to which Mr. WAKEFIELD responded.

The 370th Meeting of the Society was held in the Library, on Wednesday, January 29th, 1896, at 7-30 p.m. Mr. W. H. HOLLAND, J. P., in the chair.

The minutes of the 369th Meeting were read and approved.

Mr. J. HAMPDEN JACKSON addressed the members on the "Niger Territories" (See page 55), and showed lantern slides from photographs taken by himself and others. Mr. Holland, Mr. Reed, Mr. Wilde, Mr. Jacoby, and Alderman Bowes took part in the discussion.

A vote of thanks was tendered to Mr. Jackson on the motion of Alderman Bowes, seconded by Dr. HAMILTON, and supported by Mr. D. A. LITTLE. Mr. JACKSON responded.

The 371st Meeting of the Society was held in the Library, on Monday, February 3rd, 1896, at 7-30 p.m. Sir W. H. HOULDSWORTH, Bart., M.P., in the chair.

The minutes of the 370th Meeting were read and approved.

The election of the following members was announced:—

ORDINARY: MESSRS. Martin Hirschberg, H. W. Ireland, John Wilkinson.

ASSOCIATE: Mr. J. P. Clark Nancarrow.

HONORARY: Mr. Mark Harrington (President of the Washington University Seattle State of Washington, U.S.A.).

The presentation of two fine etchings, "Muscle" and "Brain," by Mr. Warbrick, was announced. Communications were read.

Mr. LIONEL B. WELLS, M.Inst.C.E., addressed the Society on "The Canals and Navigable Rivers of England." (See page 148.) The address was illustrated with a large map, specially prepared by Mr. Wells, showing all the canals, their condition, capacity, and controlling authorities, and with a fine map published in 1830, lent by the Secretary.

Sir W. H. Houldsworth, M.P., Alderman Bowes, Mr. H. T. Crook, C.E., Mr. Fred Morton, Mr. C. R. Dyke (of the Rochdale Canal), and Mr. J. Howard Reed took part in a lively discussion.

The CHAIRMAN moved, and Mr. J. HOWARD REED seconded, a vote of thanks, to which Mr. WELLS replied. Thanks were also tendered to Sir W. H. Houldsworth for occupying the chair.

The 372nd Meeting of the Society was held in the Library, on Wednesday, February 12th, 1896, at 7-30 p.m. Alderman Sir BOSDIN T. LEECH, J.P., in the chair.

The minutes of the 371st Meeting were read and approved.

A number of presentations were announced, including a collection of spears, poisoned arrows, ornaments, utensils, etc., from Mr. J. Ainsworth, Machakos, British East Africa.

Mr. Alderman I. BOWES addressed the Society on "The Nicaragua Canal." (See page 140.) Maps, lantern slides, and diagrams, specially prepared by the "Victorians" for this address, were exhibited.

After some discussion, the CHAIRMAN moved a vote of thanks to Mr. Bowes, which was seconded by Mr. HUNTER (of the Ship Canal Company), supported by the Rev. S. A. STEINTHAL, and responded to.

Very hearty thanks to the Chairman were given.

The 373rd Meeting was held in the Library, on Monday, February 17th, 1896, at 7-30 p.m. Alderman Sir W. H. BAILEY, J.P., in the chair.

The minutes of the 372nd Meeting were read and approved.

Mr. WILLIAM GRAY, M.R.I.A., addressed the Society on "County Antrim, and the North-East of Ireland," and illustrated his address with a large number of fine lantern slides from his own photographs.

Mr. GRAY gave the Society an invitation to visit Antrim from the Belfast Naturalists' Society, and offered to conduct a small party round the district.

The Rev. S. A. STEINTHAL moved, and Mr. McKEGG seconded, Mr. BELLAMY, Mr. COSTLEY, and the SECRETARY supported, a vote of thanks to Mr. Gray. Thanks were passed to Sir William Bailey for his services as Chairman.

The 374th Meeting of the Society was held in the Library, on Tuesday, February 25th, 1896, at 7-30 p.m. Professor W. BOYD DAWKINS, M.A., F.R.S., in the chair.

The minutes of the 373rd Meeting were read and approved.

Mr. H. O. FORBES, LL.D., F.Z.S. (Director of the Liverpool Museums), addressed the Society on "Travel and Adventure in New Guinea." Maps and lantern slides, prepared by Dr. Forbes, were exhibited.

After the discussion, a vote of thanks was passed to Dr. Forbes for his interesting address, on the motion of Mr. MARK STIRRUP, seconded by Mr. S. OPPENHEIM. Professor Boyd Dawkins was thanked for presiding.

The 375th Meeting of the Society was held in the Library, on Wednesday, March 11th, 1896, at 7-30 p.m. Mr. THOMAS NEWBIGGING, C.E., in the chair.

The minutes of the 374th Meeting were read and approved.

Mr. HERBERT BOLTON, F.R.S.E. (of the Manchester Museum, Owens College), addressed the Society on "The Surface Geology of Rossendale." (See page 179.) The address was illustrated with geological maps and sections, large diagrams, and a series of lantern views prepared from Mr. Bolton's photographs.

The CHAIRMAN, the historian of the Forest of Rossendale, made some remarks on the great value of a minute study of this interesting portion of the County Palatine, and gave some results of his experience during a long residence in the district.

The Secretary and Mr. Massey joined in the discussion, and the Rev. S. A. STEINTHAL moved, Mr. J. D. WILDE seconded, and Mr. A. Y. SCHOLFIELD supported a vote of thanks. In reply, Mr. BOLTON suggested that the members should visit the Manchester Museum, and afterwards get up an expedition to the district of Rossendale.



OLD HOUSES, UNDERBANK, BACUP.

(Houses are now altered.)

The 376th Meeting was held in the Memorial Hall, Albert Square, on Monday, March 16th, 1896, at 7-30 p.m. The Rev. S. A. STEINTHAL, F.R.G.S., in the chair.

Mr. E. W. MELLOR, J.P., F.R.G.S., F.I.Inst., addressed the Society on "An Unfrequented Corner of Italy." The address was the result of Mr. Mellor's journey the previous summer in the north-western part of Italy, extending from Turin to the mountains and south to Genoa, and was illustrated with a fine series of photographic views shown in Mr. Mellor's splendid lantern.

Sir BOSDIN LEECH moved, and the Chevalier FROEHLICH seconded, a very hearty vote of thanks to Mr. Mellor for his magnificent exhibition of views and most interesting address. Mr. MELLOR responded.

The 377th Meeting was held in the Library, on Wednesday, March 25th, 1896, at 7-30 pm. The Rev. S. A. STEINTHAL, F.R.G.S., in the chair.

Minutes of the 375th and 376th Meetings were read and approved.

The election of the following members was announced:—

ORDINARY.—Messrs. Frederick S. Ashworth, Andrew Bennie, F. A. Butter, Walter Taylor, A.M.Inst.C.E., J. Yates, M.D., J.P.

Mr. J. HOWARD REED, Hon. Secretary of the "Victorians," addressed the Society on "The Elements of Map Projection" (see p. 232, vol. xi.). A large number of elaborate diagrams and models, prepared by Mr. Reed, were exhibited, and were very much admired.

The paper provoked some discussion, and very hearty thanks were passed to Mr. Reed.

The 378th Meeting was held in the Library, on Monday, March 30th, 1896, at 7-30 p.m. Dr. A. W. WARD, Principal of Owens College, in the chair.

Dr. J. A. ERSKINE STUART (of Dewsbury), F.S.A.Scot., L.R.C.P.Ed., addressed the Society on "The Brontë Country." The address was illustrated with a number of engravings.

Mr. Consterdine, Mr. J. J. Gleave, the Rev. S. A. Steintal, the Secretary, and the Chairman addressed the meeting, and thanks were given to Dr. Stuart.

The 379th Meeting was held in the Library, on Friday, April 10th, 1896, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

Professor JOHN MILNE, F.R.S., formerly of Japan, addressed the Society on "Earth Movements and Earthquakes." Mr. Milne illustrated his address with experiments, diagrams, and lantern views. Some of the instruments used in the experiments were specially prepared for this address.

A very hearty vote of thanks was passed to Mr. Milne, on the motion of Mr. MARK STIRRUP, seconded by Mr. COTTINGHAM, and supported by Mr. SOUTHWARD. Mr. MILNE responded, and replied to the discussion.

The 380th Meeting was held in the Library, on Friday, April 17th, 1896, at 7-30 p.m. Mr. S. OPPENHEIM, Honorary Treasurer, in the chair.

Minutes of meetings 377, 378, and 379 were read and approved.

The election of Mr. J. G. Saltmarsh, A.R.C.Sc., as an ordinary member was announced.

The SECRETARY addressed the Society on "A Thousand Years of Hungarian History."

Dr. WILLIAMSON read selections from "Notes of a journey down the Danube to Budapest."

"We were very fortunate in the time of our visit to Buda Pest: during the week we spent there we had the advantage of two Saints' days and the Emperor's birthday, when we had the pleasure of seeing a fine review of the Hungarian troops.

One of the saints' days was St. Stephen's Day, the great Hungarian holiday. This day, August 20th, is still hallowed to the memory of Stephen, the celebrated King of Hungary, who reigned between the years 997 and 1038. Stephen was the first Christian King of Hungary, and he it was who made the conversion and civilisation of the wild Hungarians the task of his life. Though 850 years have passed away since his death, the Hungarians of to-day still fondly refer to his exalted example; and the good deeds and wise writings of this great king show how worthy he was of their admiration.

The Hungarian kings are still crowned with the crown of King Stephen. Some 300 years ago Stephen was canonized by the Church of Rome, and his name was placed on the Calendar of Saints; and certainly he appears to have been well deserving of the honour. His right hand has been preserved embalmed, and on the 20th of August every year the embalmed hand is carried through the streets of Buda in a solemn procession.



THE PROCESSION (SHOWING THE CASKET CONTAINING THE HAND OF KING STEPHEN)
AT BUDA, AUGUST 20TH.

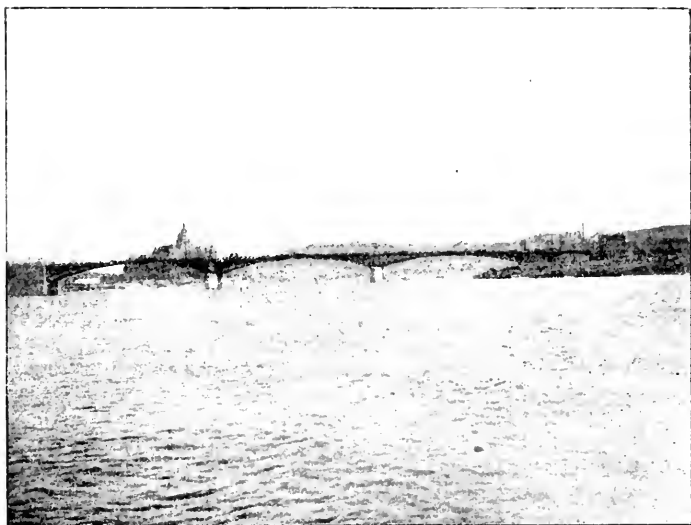
We were particularly desirous of seeing the procession, and took our place in the crowd in the streets of Buda early in the morning on August 20th. [Here a snap-shot photograph was shown of the procession passing through the streets of Buda with the embalmed hand of King Stephen in a glass case.] Every year thousands of people visit Buda Pest, on August 20, in order to see the hand of King Stephen. After the embalmed hand has been carried through the streets it is taken to the Royal Palace, and may there be inspected more closely. The hand is enclosed in a small glass case; this is held by a Catholic priest, and the pious Hungarians walk up to the priest one at a time, and reverently kiss the glass case. After each kiss the glass case is rapidly rubbed over with a cloth by the priest.

We took our place in the crowd, and, after a terrible crushing, succeeded in gaining admission to the castle. When our turn came we walked up to the priest; and then came a startling question. Everybody had kissed the case; ought we to do so also? what would the pious Hungarians think if we did not? Hygienic scruples flashed across our minds. The case had already



A VIEW OF KING STEPHEN'S HAND.

been kissed by many hundreds that day. We walked up to the priest, had a good view of the hand, and passed by, and did not kiss the case. [A photograph was here shown giving a representation of the hand of King Stephen. Other photographs of a Hungarian swineherd, soldier, gipsy, etc., were shown.]



BRIDGE FROM BUDA TO PEST ACROSS THE DANUBE.

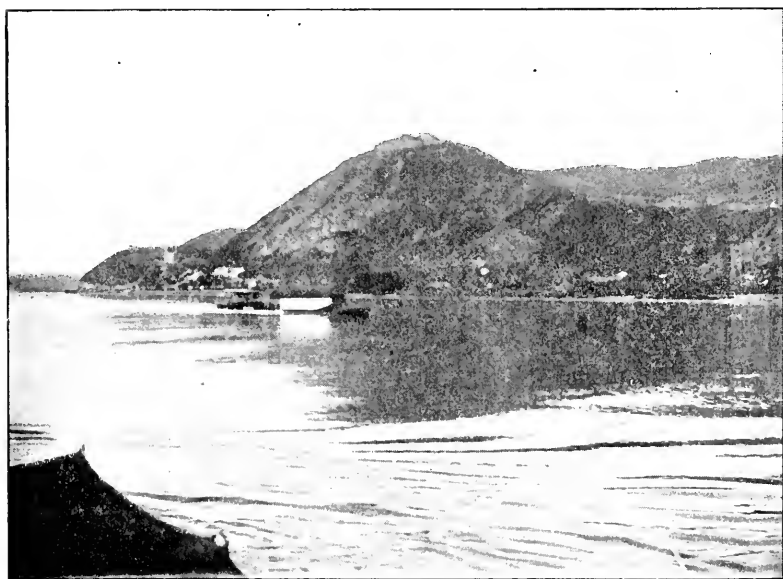
Views of scenery and buildings only faintly represent the interest and pleasure of a visit to Hungary.

During the 15th, 16th, and 17th centuries, as Mr. Sowerbutts has told us this evening, Hungary was the battle-ground between the Turks and Western

Europe. Hungary is perhaps as interesting historically as any country in Europe; some of us find Hungarian history more interesting than that of any other country. A study of the various races who inhabit the banks of the Danube is also full of interest. Then again, it is a pleasure indeed to an Englishman to ramble about the Hungarian towns and villages, to live for a short time the happy, gay, Hungarian life—apparently so happy and so gay in comparison with life in Manchester.

Even the average English visitor who has no special interest in historical or geographical studies is sure to derive great pleasure from a visit to Hungary.

In the first place, if he should be fond of wine, he will probably long remember the delicious, sweet Hungarian wine, especially the Tokay wine.



RUINS OF THE ONCE SPLENDID CASTLE AND PALACE OF VISEGRAD, OF KING MATTHIAS.
(Scene from the River.)

He will never forget the wild Hungarian gipsy music, Almost everywhere in the evening this music is to be heard—in the public gardens, in the restaurants, and in the smallest cafés. Most of the musicians play by ear, and have no theoretical knowledge of music. Its peculiar fascinating charm will never be forgotten.

And then the English visitor is sure to have the most pleasant remembrances of the true Hungarian people. He will ever remember the handsome features, the dark, sparkling eyes and merry faces of a large proportion of the Hungarians, and will always remember their warm-heartedness, generosity, and hospitality.

Probably in no country on the Continent is the Englishman so much respected as in Hungary. This is owing partly to England's sympathy with Hungary in the revolution of 1849; and perhaps partly to the fact that England is the first sporting nation in the world, and the Hungarians also are great lovers of sport.

Those of you who may visit the Exhibition are sure to have a most enjoyable holiday and the warmest reception from the Hungarian people."

Lantern views were shown to illustrate the remarks of Mr. Sowerbutts and Dr. Williamson. Mr. J. Hindle, L.R.A.M. (piano), and Mr. G. A. Pennington (violin), gave selections of Hungarian music.

The CHAIRMAN, Mr. Oppenheim, gave an account of the Millennial Exhibition and the arrangements for visitors to Budapest during the summer.

The Rev. S. A. Steinthal, Mr. J. C. Blake, Mr. R. C. Phillips, Mr. J. Howard Reed, and Mr. J. J. Warbrick took part in the discussion, Mr. Steinthal giving a description of travel in Transylvania.

Very hearty thanks were passed to all the gentlemen who had taken part in the meeting, and to Mr. OPPENHEIM for the presentation of a large number of papers describing the Exhibition at Budapest. The CHAIRMAN replied.

The 381st Meeting was held in the Library, on Wednesday, April 22nd, 1896, at 7-30 p.m. The Chevalier FRÖELICH in the chair.

The minutes of the 380th Meeting were read and approved.

Communications were read, including a note from Mr. MARK SHELTON, Foreign Corresponding Secretary of the Geographical Society of the Pacific, on the work of the United States Government expedition in search of M. Andrée's balloon.

Mr. WILLIAM HARPER addressed the Society on "Australia: Its History and Progress." (See page 109.) The address was illustrated by a large map, prepared by Mr. Howard Reed for Mr. Snaddon, and a large number of lantern views.

Alderman I. Bowes moved, and Mr. EGBERT STEINTHAL seconded, a vote of thanks. Mr. HARPER, in responding, replied to a large number of questions on artesian wells, the distribution of gold, the railways and telegraphs, irrigation lands, and other questions.

The report of Mr. A. J. HERBERTSON, F.R.G.S., Lecturer in Geography at Owens College, was read.

REPORT BY THE LECTURER IN GEOGRAPHY IN THE OWENS COLLEGE, MANCHESTER, 1895-96.

THE ordinary classes in geography at the Owens College are attended almost exclusively by first year students of the day training department. This class was a small one in 1895-96, and the Education Department's regulation, excusing excellent geographical students, was again effective in making the numbers smaller than they might have been. Two courses of lectures were delivered, one on "British Possessions in America and Africa," and one on "Cartography." The lecturer proposed to give a third course of practical

geography, but this was not sanctioned on the ground of lack of time. A few students, who had one spare hour a week, were induced to devote it to map-drawing under the lecturer's supervision.

By the courtesy of the Manchester Geographical Society, the Owens College Evening Classes in Geography were held in the rooms of the Society, and their valuable collection of maps and lantern slides were placed at the lecturer's disposal, as well as the use of their lantern. The subject of the course delivered before Christmas was "The Commercial Geography of Eastern Asia," and in 1896 two short courses of five lectures each were given: (1) "The Highways of Commerce: The Great Ocean Routes;" (2) "The Commerce of Africa."

Despite the advertisements of the Manchester Geographical Society and the College, and the personal efforts of the Honorary Treasurer and Secretary to make these courses known among commercial houses, the number of students was disappointingly small. There are, however, several other centres in Manchester where Commercial Geography is taught. The lecturer would suggest that in future only one of the evening classes be on Commercial Geography, and that the other be planned to suit the requirements of teachers. One third of the students attending the classes last winter were teachers.

The lecturer has to thank Mr. Oppenheim and Mr. Sowerbutts for their great interest and help in making the classes as successful as they were, and Mr. Harry Sowerbutts for his assistance with the lantern at several lectures.

Two courses of University Extension Lectures were delivered; one, of twelve lectures, on "The General Geography of Greater Britain," to the students of the Warrington Training College; the other, on the "Far East," in conjunction with the Yorkshire College and the Young Men's Christian Association, at Leeds. In addition to these courses, a number of single lectures on geological subjects were delivered in the vicinity of Manchester in connection with the "Victorian" lecture scheme of the Manchester Geographical Society.

The lecturer has to thank the Royal Geographical, the Manchester Geographical, and the Royal Scottish Geographical Societies for lending maps, books, and lantern slides needed to supplement the small resources of the geographical department at the Owens College, for the preparation and illustration of lectures.

During the last year considerable progress has been made in forming the nucleus of a geographical collection at Owens College. A better room, well-lighted and furnished with cases, has been provisionally set apart for the use of the geographical department, and a grant of £30 voted to buy materials. Part of this sum has been spent on apparatus for practical work, and part in buying maps and books. Something has been done towards forming a small library of standard geographical works, and also in collecting geographical text-books for use in schools, to enable intending teachers to form an opinion as to the books suitable for their future work in schools. The department is indebted to the Council of the Royal Geographical Society, who have very generously presented a complete set of the last series of the Proceedings of the Society and the four volumes of Supplementary Papers; and to Professor Meiklejohn, Messrs. Longmans and Co., and Messrs. Philip, Son, and Nephew, who have very kindly presented copies of their geographical school books.

Nevertheless, under existing conditions, the work of the geographical lecturer is not very encouraging, and the pecuniary sacrifice he is called on to make is considerable. He gets only the poorer material to work upon, owing to the Education Department's regulations and the lack of any University recognition of the subject. Even then he labours at a disadvantage. The students are well aware that their geographical work is somewhat of the nature of a humiliating necessity, a penalty for not doing well enough in the subject in the Queen's Scholarship Examination. They naturally feel that it would be a pity to spend more time over it than the bare minimum necessary to satisfy the Education Department, and for this the College allow about a score of hours in the year. The University authorities are being memorialised on the subject, and also with reference to other modifications of existing regulations, which, without in any way interfering with existing interests, would place the geographical department in a much better position to do good work.

The lecturer regrets that under the existing conditions he is unable to ask for a renewal of his appointment.

The Owens College,

ANDREW J. HERBERTSON.

The 382nd Meeting was held in the Library, on Wednesday, April 29th, 1896, at 7-30 p.m. The Rev. L. C. CASARTELLI, M.A., Ph.D. (Rector of St. Bede's College), in the chair.

The minutes of the 381st Meeting were read and approved.

The Rev. S. A. STEINTHAL, F.R.G.S., F.I.Inst. (Chairman of the Council), addressed the Society on "A Recent Visit to Madeira and the Canary Islands." The address was illustrated with lantern views.

Dr. Casartelli, Mr. Jacoby, Mr. Gleave, the Secretary, and others took part in the discussion.

Mr. S. OPPENHEIM moved, Chevalier FROEHLICH seconded, and Mr. J. HOWARD REED supported a resolution of thanks to Mr. Steintal for his address, referring also to his great labours on behalf of the Society.

The 383rd Meeting was held at the Manchester Museum, Owens College, on Saturday, May 2nd, at 3 o'clock. Mr. J. H. LEWIS in the chair.

Mr. H. BOLTON, F.R.S.E., addressed the Society in an admirable way on "The Geology of Rossendale," illustrating the address by exhibiting a number of fine fossils from the Millstone Grit and the shales of the Coal measures of the valley, from the Crispin Dugdale collection of fossils and rocks.

The picturesque appearance of the valleys was made very clear, and the way in which the wearing down by aqueous and subaerial agency was brought about was very well worked out.

The super-position of the rocks in Rossendale, and the history of them, was made clear.

THE GEOLOGY OF ROSSENDALE.

By Mr. H. BOLTON, F.R.S.E.

THE district which this Society will visit, is perhaps the best which could have been selected for the study of the chief features of the Millstone Grits and Lower Coal Measures. The former series reach a thickness of fully 1,000

feet, and consists of compact sandstones of considerable mercantile value, interbedded with dark shales and a few thin coals.

The Lower Coal Measures consist of about 800 feet of rock, which is mainly composed of shales, and coarse sandstone; several seams occur, but only three have been worked to any extent, and only one can be considered of importance.

Two features will at once arrest the attention of the visitor to Rossendale, *i.e.*, the succession of huge quarries along the hill-tops, and the mode of working the coal seams. With a single exception, the coal seams are wrought along the hill-sides, and "adits," or nearly horizontal passages, take the place of the more familiar pit-shaft.

In several cases, the seams are worked at distant points on the hills, the coal being brought down the valleys along chain roads of great length.

The sandstones and shales are fairly fossiliferous—that is, they contain the remains of various animals and plants which existed in that far-away time.

The sandstone fossils are usually mere casts of the exterior of plants, although, at times, beautiful fern impressions are seen upon the flagstones. The shales contain an abundance of ferns, fish scales, teeth, and many shells.

One of the highest seams of coal is of more than usual interest. It is known as the "bullion" coal, from the occurrence of certain nodules of vegetable matter which are enclosed in the coal. In these nodules the most delicate structures have been preserved, and it was by the continued examination of these "coal-balls" from Oldham, Rossendale, and other places, that the late Professor Williamson was able to add so much to our knowledge of the plant life of the Coal Measures.

The shales, immediately over this coal, are rich in fish remains, and contain a second series of nodules, called "baum-pots," in which shells, and not plants, are preserved. Most of these latter nodules have a thick outer crust of iron pyrites, which make them difficult to break; but once broken, they usually yield well-preserved *Aviculopectens* and *goniatites*.

A good idea of the Rossendale fossils may be obtained from the collection in the Museum, which was made several years ago by the late Mr. Crispin Dugdale. The collection formed the subject of an important paper read before the Manchester Geological Society by Mr. Dugdale in 1887.

The address was listened to with great attention, and the subsequent demonstration in the Museum was of interest.

Hearty thanks were tendered to the Museum authorities, and to Mr. Bolton, on the motion of Mr. J. HOWARD REED, seconded by Mr. G. MASON.

The 384th Meeting was held in the Library, on Wednesday, May 6th, at 7-30 p.m. Mr. R. C. PHILLIPS in the chair.

The minutes of last meeting were read and approved.

Letters from Dr. W. J. Black on South African Ports, Mr. C. H. Bellamy on Victorian lectures, the Rev. J. McDougall on a new method of Teaching the Geography of Palestine, and Mr. J. S. Western on the Memorial to Examiners of Secondary Schools on the Position of Geography were read.

GEOGRAPHICAL ASSOCIATION.

Communicated by Mr. J. S. MASTERMAN, Assistant Secretary.

The Annual Report shows a steady increase in numbers, the Association being now represented by 44 secondary schools, including most of the great public schools. In the course of the year 1896 two lectures were published by the Association, one by Mr. B. B. Dickinson, explaining his method of teaching geography by means of lantern-slide maps and diagrams, and the other by Mr. E. R. Wethey, entitled "A geography lesson; the blackboard and oral teaching." A revised catalogue of the Association's slides, then amounting to 684, was issued in March. The number has since been considerably increased, and Mr. Dickinson is now engaged in remaking many of the early experimental slides, with improvements suggested by increased experience and newer methods. Demonstrations of the use of the Optical Lantern in teaching were given at the General Conference of the Teachers' Guild in January, 1896, and at the Headmasters' Conference in December, as well as on other occasions.

The chief work of the past year has, however, been to prepare and send out a Memorial to certain Boards of Public Examiners on the subject of Reforms in Examinations in Geography.

Memorandum of Reforms in Examinations in Geography advocated by the Committee of the Geographical Association:—

1. That the main principles of Physical Geography should form the basis of Geographical teaching at all stages, and should be fully recognised in all examinations in Geography.

2. That a general knowledge of Geography, based on physical principles, should be required, together with a special study of some selected region, *e.g.*, India, a group of British Colonies, South America, Central Europe.

3. That it is desirable that all Public Examining Bodies, such as the Civil Service Commissioners, the Universities (in their Local and Certificate Examinations, and London Matriculation) and the College of Preceptors, should recommend a course of instruction in accordance with the ideas suggested above. This would stimulate Geographical teaching in schools, ensure that Geography should be systematically taught throughout the school, and do away with the need for separate classes to prepare candidates specially for the various public examinations in Geography.

4. That in the examinations above referred to Geography and History should be dealt with in separate papers, and that the maximum of marks should be approximately the same for each.

B. BENTHAM DICKINSON (Rugby), Hon. Sec.

J. ROBINSON (Dulwich).

May, 1896.

The results thus far obtained are recorded in a separate report, and are in some cases most encouraging.

The Oxford delegates and Cambridge syndics for local examinations expressed their general agreement with the principles advocated by the

Association, and their willingness to consider any more detailed suggestions that the Association might wish to make. With the view of encouraging the higher study of Geography, and of providing an examination which may serve as a satisfactory test of a teacher's knowledge of the subject, they have decided to include Geography as a new group in the higher local examinations. Full particulars will be found in the new regulations for 1896-7.

The Oxford and Cambridge Schools' Examination Board, after considering the Memorial, decided to insert the following paragraph in the regulations affecting Geography in the lower certificate examination:—

"The questions shall be set on the assumption that the main principles of Physical Geography form the basis of Geographical teaching."

The Council of the Victoria University, Manchester, received the Memorial with much favour, and a special committee of the Board of Studies has been appointed to consider the question of giving Geography a more important place in the preliminary examinations.

The improved style of questions on Geography set in the Army Entrance Examinations during the last few years encourages the belief that the Civil Service Commissioners are to a large extent in sympathy with the aims of the Association. But the marks assigned to the paper on Geography (500) are certainly inadequate in view of the amount and wide range of the knowledge that is required.

The Annual Meeting was held in the Hall of Dr. Williams's Library, Gordon Square, on Wednesday, December 23rd, 1896, Mr. J. G. Colmar, C.M.G., in the chair. After the transaction of business, a paper was read by Mr. A. W. Andrews on "The Teaching of Geography in Preparatory Schools and Junior Classes," which was followed by a discussion. Mr. Andrews also reported that at the Conference of Headmasters of Preparatory Schools, held in London on December 22nd, the following resolution had been carried: "That it is desirable that every boy, before admission to a public school, should have to pass an elementary examination in History and Geography." The Committee of the Geographical Association have decided to give their hearty support to this resolution, and to address a letter on the subject to the headmasters of public schools.

The Rev. W. VIVIAN (formerly of Sierra Leone) addressed the Society on "The Mendi Country" (see page 1), which was a very able geographical description of the colony, and of the people, their manners, customs, beliefs, and their industries and commerce.

This admirable address was illustrated with a fine selection of photographic slides from photographs taken by Mr. Vivian.

The address was made more interesting by an exhibition of native cloths, iron-, wood-, and stone-work, by carvings and material products placed at the service of the Society by Lady Bosdin Leech and Mr. Vivian.

The articles and their uses were explained by Mr. Vivian, and, in some cases, the mode of manufacture. An exhibition was also made of the fine set of native weapons and ornaments sent to the Society by Mr. John Ainsworth, of Machako's.

A communication from Mr. J. J. Leech (see page 35), of Bonthe, Sherbro Island, was also read.

Mr. J. PICKERING and Mr. J. J. COTTRILL moved and seconded a very hearty vote of thanks to Lady Leech, Mr. John Ainsworth, and to the Rev. W. Vivian for the excellent contributions to this interesting meeting. Sir BOSDIN T. LEECH and Mr. J. HOWARD REED supported the resolution. Several of the speakers referred to the need for railway development in the colony, and to the promising field therein for the judicious employment of a good deal of capital.

Mr. VIVIAN replied to a number of questions from the Chairman and others, and the resolution was most cordially passed.

The 385th Meeting was held in Phillips Park, Bradford, on May 9th, 1896, at 3 o'clock.

A party of members visited this park for the purpose of inspecting the fine show of tulips, and they afterwards made a visit to the Ancoats Art Museum.

The party was very much interested, and spent a very pleasant afternoon.

The 386th Meeting was held in the Library, on Monday, May 11th, 1896, at 7-30 p.m. Mr. T. R. WILKINSON (Consul for the Ottoman Empire), in the chair.

The minutes of the last meeting were read and approved.

The election of the following members was announced:—

ORDINARY: Miss Ashworth, Mr. Joshua Gibson, Mr. A. F. Winks.

The death of Mr. Cannon was announced, and a vote of condolence with his wife and family was directed to be forwarded.

Letters from Sir A. Maloney, on his journeyings in British Honduras; and from Mr. Curzon on the "Brönte" Country Excursion, were read.

A map, sent by the Military Intelligence Department, to illustrate the operations of the Unyoro Field Force, was exhibited.

Mr. J. D. WILDE, M.A. (one of the Honorary Secretaries), addressed the Society on "Old Manchester," illustrating his address with a number of maps, diagrams, and lantern slides, which had been specially made for this address. Mr. S. L. Coulthurst had also lent a large number of lantern slides for the same purpose.

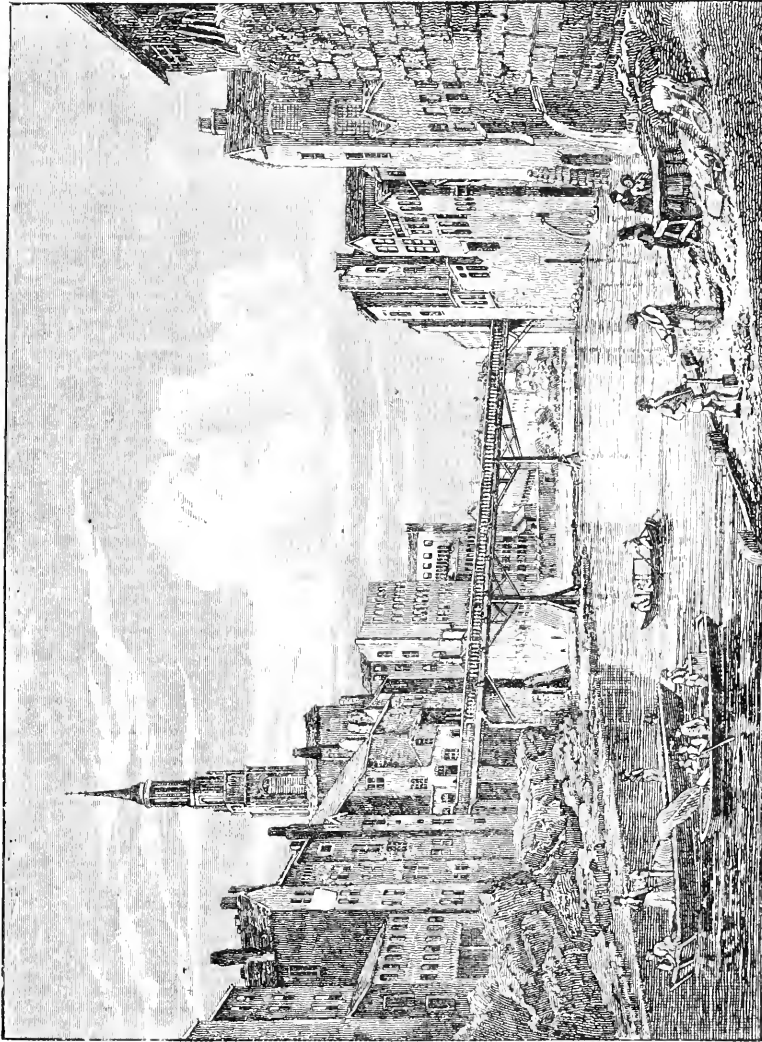
Several questions were asked, which were replied to by Mr. Wilde.

The CHAIRMAN made some observations on Old Manchester, and the development of the city, of a very interesting kind, being partly his own reminiscences.

Very hearty thanks were voted to Mr. Wilde for his address, on the motion of Mr. MASON, seconded by Mr. W. HOLT. Mr. WILDE moved a vote of thanks to the Chairman and Mr. Coulthurst for the loan of the slides. The motion was carried with acclamation, and Mr. WILKINSON responded.

[We are glad to be able to supply some characteristic views of the Old Borough.—ED.]

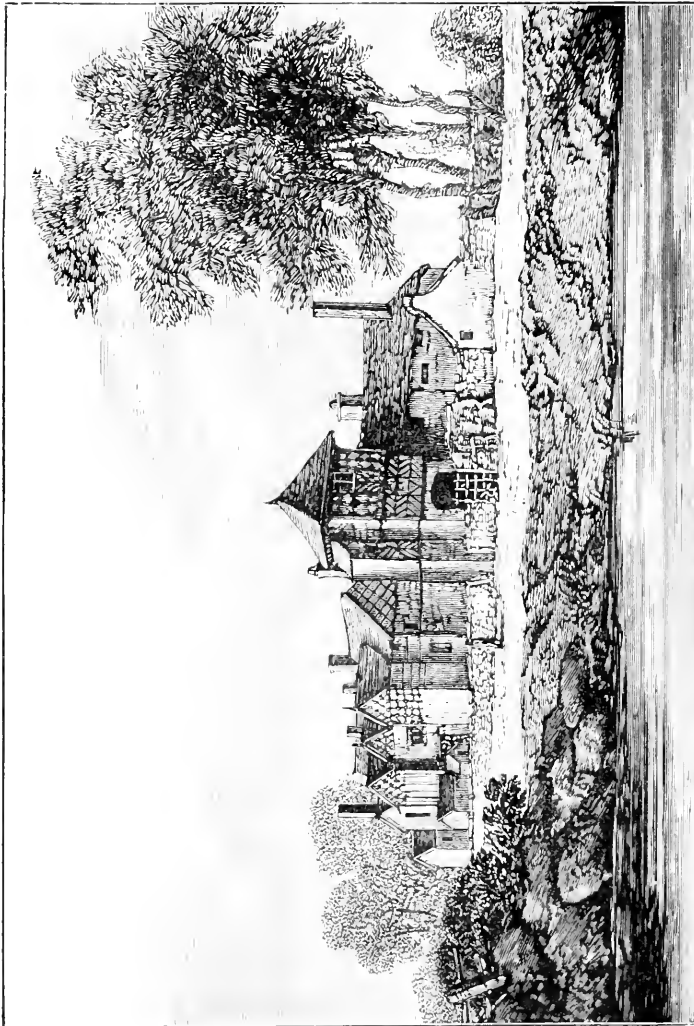
The 387th Meeting was held on Saturday, May 16th, 1896, at the Cold Air Stores, Water Street, and Cattle Lairages, Mode Wheel, of the Manchester Corporation. Mr. REUBEN SPENCER, J.P., in the chair.



OLD BLACKFRIARS BRIDGE.

Mr. Councillor J. SHERRATT, J.P., had made arrangements for the visit, and the officials at both places received the members and gave explanations of the works. The Cold Air Stores were inspected, under the guidance

of Mr. Fairhurst; and a steamer conveyed the party through the docks, which were well filled with traffic, to the Lairages, where Captain Thomson took the lead.



HULME HALL.
(Now destroyed.)

Mr. REUBEN SPENCER gave an address, and Mr. E. F. STEINTHAL moved, Mr. C. H. BELLAMY seconded, Mr. J. T. LEES and Mr. T. DENTITH supported, a vote of thanks to the authorities and others who had given assistance. Mr. Councillor SHERRATT replied.



STAIRCASE, CHETHAM COLLEGE.

(Almost an exact facsimile of a staircase at Turton Tower.)



The 388th Meeting was held in the Library, on Friday, May 15th, 1896. Mr. J. E. BALMER, F.R.G.S., in the chair.

The minutes of the last meeting were read and approved.

A "Carta del teatro della guerra nell'Africa Italiana," by Handkte, presented by Mr. N. Kolp, through the Treasurer, was exhibited to the members.

The Treasurer, Mr. S. Oppenheim (Vice-Consul for Austria-Hungary), having gone to Buda Pest, the occasion was made use of to forward to the Hungarian Geographical Societies the congratulations of the Society on their celebration of the 1,000th year of the nation's history.

The Rev. F. GALPIN addressed the Society on "Life in China," illustrating his address with a large and choice collection of Chinese models, wood-carving, metal-work, books, diagrams, maps, drawings, articles of dress, from slippers to a wedding dress, and some very beautiful silk embroidery.

LIFE IN CHINA.

By the Rev. F. GALPIN.

THE press in England has but little to say just now regarding China; but the reason for such silence is easily found.

English interests are world-wide and cosmopolitan, hence her attention changes from time to time according to the course of events which claim notice.

If I remind you that at the present time not less than 5,000 Englishmen reside in China, and in many ways help to educate and improve the Chinese, this reminder may be a sufficiently powerful claim upon your attention for a short time this evening.

The moderation and mercy shown by our soldiers during the wars with China called forth the admiration of the Chinese people. Hitherto, the only successful armies they knew had always celebrated their victories by unbridled brutalities at the expense and ruin of the conquered people.

Then the English settlements on the coast of China, well drained, and cleanly kept and managed by merchants, who received no money for their efforts, were, or should be, an eye-opener to the avaricious officials or public men in China.

Our doctors, including our surgeons in the British Navy, gladly helped the medical missionaries whenever they had the opportunity.

Then there were some hundreds of English missionaries, many of whom gave much attention towards providing a better system of education for the young in China. I ought also to mention that several English Consular and Customs officials have done good work by translating into Chinese many useful school books.

The results of such work would be greater to-day than they actually are, if they had not been hindered by the scornful pride of the Chinese literati. But this pride is equally matched by the gross ignorance of the working-classes in China. They are utterly ignorant of geography, and have no society corresponding with our Geographical, or, indeed, any other societies. Neither was there any honest and sincere desire to gain useful knowledge. The literati had shown wonderful energy in circulating slanderous and impure books, and also by charging foreigners with all sorts of gross and malicious deeds; but they had not yet shown any desire to spread

wholesome and useful knowledge. These men, who really held the empire in their hands, were all so apathetic themselves that they could not understand an Englishman in the employ of their Government earnestly desiring to do some of the work he was paid to do. If his pay was sure, why need he trouble the authorities because subordinate officials hindered the performance of the special work he was engaged to do?

One of the difficulties in the way was the old Chinese written language, which differed from the spoken, and was known by only a small percentage of the men. Missionaries who desired to make the acquisition of knowledge easy, and to place it within the reach of the poor, adopted a Romanised system, which, although despised by the literati, had already accomplished much good; and now a Romanised inscription appears on the new silver currency issued by the provincial governments.

The lecturer also said that the Chinese were an easy-going people, fond of humour; and he gave one or two examples of Chinese wit, and also a specimen of native music.

Several articles were exhibited, showing the Chinese skill in wood carving and silk embroidery, and some cartoons, painted by native artists, to illustrate the customs of the people.

A number of questions were put which elicited a good deal of information on the marriage customs, the condition of women, the question of morals, opium smoking, and other subjects, and added very largely to the interest of the address.

Very hearty thanks were given to Mr. Galpin for his address, and to Mrs. Galpin for her trouble in arranging the Chinese exhibition. The exhibition was visited by many members during the day.

The 389th Meeting was held in the Library, on Wednesday, May 20th, 1896, at 7-30 p.m. Mr. THOMAS DENTITH in the chair.

The announcement of the Queen's birthday honours to the President of the minutes of the last two meetings were read and approved. the Royal Geographical Society was received with pleasure.

Mr. J. HOWARD REED proposed, and the Chevalier FROELICH seconded, a resolution that the following telegram be sent to Sir C. B. Markham:—

SIR CLEMENT B. MARKHAM,
1, Savile Row, London,

Manchester Geographical Society, now assembled, congratulates you on your birthday honours.

SOWERBUTTS, Secretary.

The telegram was sent.

A letter from Chimbulunga, Chibwabwa, Africa, was read, and caused some amusement.

Letters from Major-General Sir F. de Winton and others were read.

The SECRETARY gave a short review of the work of the Society during the past session, referring to the meetings and new premises of the Society, the *Journal*, the work of the Education Committee, the interesting Friday meetings for the study of geographical questions, and the work of the Victorians.

The Hon. Secretary of the Victorians gave a short account of their work.

These reports led to some conversation, and the members expressed their surprise at the enormous amount of good work done by the Society.

During the evening, Mr. R. C. Phillips, Mr. P. Harrison, and Mr. Bebbington gave selections of instrumental music, which were very much appreciated. Light refreshments were served in the map-room.

A very pleasant evening was brought to a close at about 10 o'clock.

Votes of thanks to the musicians were proposed by Mr. J. D. WILDE, and seconded by Mr. BRADSHAW; to Messrs. Dentith and Reed by Mr. LORD and Mr. WILLIAMSON.

The 390th Meeting of the Society was held at St. John's Church, Deansgate, on Saturday, May 23rd, at 3 o'clock.

The members were received at the church by the Rev. E. F. Leech, the rector, who showed the church, its Flaxman and other monuments, painted windows, an ancient silver staff, oil paintings in the vestry, the registers, a long list of signatures of Manchester worthies at the time of the foundation, and some of the graves of noted Manchester men.

The members were delighted with their visit, and were surprised to find so many objects of interest in the church of the Byroms and Clowes.

Very hearty thanks were tendered to Mr. Leech for his kind attention.

The 391st Meeting was held at the Devonshire Arms, Dore, on Saturday, June 6th, 1896, at 5-30 p.m. Councillor BERRY in the chair.

VISIT TO DORE.

THIS was an exploration visit by a good number of members of the Society. The journey was undertaken as one of a course of excursions and functions held during the year for the purpose of adding to the knowledge of places and their history which would be likely to interest them. The excursion figured on the programme as "An Afternoon in Derbyshire," and the tempting attractions of the "moors, where the poet Richard Furness lived and wrote," were duly set forth. The point of interest which the geographers were most anxious to see was Beauchief Abbey, with its clinging memories of the peaceful seclusion of bygone ecclesiasticism. The lovely fringe of wayside fern, which lines the tortuous path up the Ryecroft Glen, and the luxuriance of wild flowers, were instanced as specific natural beauties which would please the visitor. Certain it is that any future wanderings of the Society will be haunted with the indelible recollection of the pastoral valley where Egbert the Saxon put the savages of Northumbria to rout.

The Manchester party arrived at Dore Station by the 3 o'clock train in the afternoon. They were under the leadership of Mr. J. Howard Reed. Mr. J. F. Atkinson, J.P., ex-Master Cutler, was on the platform to meet them, and after partaking of refreshments, with that gentleman as host, the walk began in the Ryecroft Glen, musical with a babbling stream, and at this time of the year forming a green alley of rustling intertwined foliage, carpeted with ferns and grasses. Following the winding path, the party emerged at length in the village, and, cutting across the country,

arrived by leisurely, chatty stages, at the historic ruin of Beauchief. The distinctive features of the crumbling walls, veiled in fresh green ivy, were discussed, and the ready local knowledge of Mr. Atkinson was freely divulged for the benefit of the visitors. The fine old Manor Hall was visited, and after a stroll in the neighbourhood, the geographers turned their steps towards the village of Dore. The church, which, although not claiming any antiquity, is chaste in architecture, was examined, and dearly cherished anecdotes relating to the late respected pastor were told, to the edification and delight of the visitors. The memorial chancel, dedicated to the late vicar, was pointed out, as well as the fine tower. This addition to the structure, which was formally dedicated by the Duchess of Rutland in October, 1895, is now quite completed, and the sacred building is additionally imposing in consequence. A detail which must not be forgotten, however, is to note that on the way the geographers were obliged, willy-nilly, to shelter themselves under the generous foliage of the trees for a space of time, as a thunderstorm caught them unawares. They emerged none the worse, and arrived at their destination, which was the Devonshire Arms, where the demands of the material man were satisfied.

The Chairman of the Society, the Rev. S. A. Steinthal, was not able to be present, but among those who were present were Councillor Berry, the Rev. S. H. Street, and Messrs. R. Wade, J. Howard Reed, G. Mason, W. Holt, W. Bradshaw, W. H. Williamson, F. Farran, H. Fullerton, J.P., Eli Sowerbutts, F.R.G.S., and many others. The rambles of the Society having been satisfactorily brought to a close by the discussion of a well-appointed meal, the inevitable, yet necessary speechmaking took place. Councillor Berry occupied the chair, and votes of thanks to Mr. J. F. Atkinson for his kindness were passed with all due enthusiasm.

During the afternoon Mr. Atkinson gave a most interesting history of Beauchief Abbey, the information having been gathered from Dr. Samuel Pegge's book on the subject.

BEAUCHIEF ABBEY.

By Mr. J. F. ATKINSON, J.P.

BEAUCHIEF ABBEY, situated in an extra-parochial liberty, free from ecclesiastical jurisdiction, was founded by Robert Fitz-Ramulph between the years 1172 and 1176, and opened for the reception of an abbot and canons of the Premonstratensian Order about the year 1183. The members of this Order were also called white canons, from their habit, which was a white cassock with a rocket over it, a long white cloak and white caps. The founder was Lord of Alfreton, Norton, and Marneham, and the monks received their names from Premonstratum, a desert valley in Picardy, bestowed upon St. Norbert, the founder of the Order, by the Bishop of Laon, and so called because pointed out, as it was said, by the Blessed Virgin to be the head of this reformed Order. Beauchief Abbey was dedicated to St. Thomas à Becket, and, in allusion to his head (which, according to the notions of those times, would be considered more sacred and beautiful on account of its being mangled and disfigured by the blows which caused his death), was called "Monasterium de Bello Capite." Although sacred to St. Thomas, it appears that at first the Virgin Mary was associated with him, the language of the charters often being "Deo et beato Mariæ et ecclesiæ beati Thomæ Martyris de Bello Capite," but after a time the donations were

made solely to St. Thomas the Martyr, and the monks themselves, by omitting the Virgin on their last conventual seal, and representing only the murder of the archbishop, appear to have wished it to be understood that he was their saint paramount. The founder, being Lord of the Manor of Norton, detached the Liberty of Beauchief from it, and, by conferring the Rectory of Norton upon his own convent at the very first caused it to be extra-parochial. In 1478 the convent consisted of an abbot and twelve brothers, as appears from the "Nomina Confratrum Monast de Beucheff" in the Ashmolean Museum.



REMAINS OF BEAUCHIEF ABBEY TOWER, NEAR DORE.

(The body of the church is comparatively new.)

No'ia Confr'm de Beuchef.

D'ns Joh'es Norton, Abbas.

Fr. Joh' Crok, sic' de Norton.

— Ric Holynbrythe, sic' de Wynswald.

— Thom' Peyton, po'r.

— Jas. Bootham, sup'or.

— Robert's Boland.

— Joh' Straw, sac'sta.

— Rob'ts Wolfeet, cantor.

— Wyllms Lwyndell, cellar'.

— Wyll'ms Drafeld, subsac'st.

— Rolandus Baalt, subcantor.

— Edmundus Føernes.

— Wyllms Deynton.

The monks prayed for their founder's soul every day after dinner, and performed a solemn service for him yearly, on the 9th of September, "*Commemoratio Roberti filii Ranulph canonici, et fundatoris hujus loci, qui dedit nobis quatuor ecclesias, scii Norton, Alfreton, Wymondeswolde, et Edwalton, et fundamentum istius Abbathiæ de Beauchief, pro quo fiet solempne servitium.*" Since his son William, Baron de Alfreton, and his grandson, Robert de Alfreton, were both buried at Beauchief, it is more than probable that he was likewise interred at the abbey. The following appears to have been the value of the monastic estate in the year 1291:—The Rectory of Norton, Derbyshire, 12 marks per annum; the Rectory of Alfreton,* Derbyshire, 15 marks; the Rectory of Wimeswold, Leicestershire, 38 marks and one penny; the Rectory of Edwalton, Notts, 12 marks; and the temporal estate of the Abbey in the same year was computed at £33 5s. The Rectory of Dronfield was given to Beauchief by Sir Henry de Brailsford, who lived in the reign of Edward I., but the convent did not get possession of it till 1399. Its value in the year 1291 was 60 marks per annum. There were numerous bequests made to the abbey, and amongst others the following, which are selected, either on account of the magnitude or singularity of the gift, or to show the motives of the donor. Sir Thomas Chaworth, a descendant of the founder, gave to the abbey "the whole hamlet of Greenhill, lying within the soke of Norton, with certain rents in Alfreton and Norton, for the salvation of his own soul, his father's and mother's, the souls of his wives and children, and for the maintenance and support of a canon of the same monastery, to celebrate divine offices for ever at the altar of the Holy Cross, in the Church of Beauchief aforesaid; for the good of his own soul, the souls of the parties above mentioned, and of all Christians departed, and for the obtaining a solemn service annually to be performed in the like manner as was usual to be done for a deceased abbot." Ralf, son and heir of Robert de Eccleshall, for his soul's health, and that of his wife, Cecelia, gave his mill at Eccleshall for the support of one of their canons and a clerk, to celebrate in the Chapel of Eccleshall, and of the fabric, and of the canons in general daily saying the Lord's Prayer on leaving the chapter house, for the soul of his father and all departed souls, until they be provided with six marks rent somewhere in exchange for the mill, which then was to revert to him and his heirs. In case of great floods or snow, the canons might celebrate at Beauchief, and they never were to send a brother who should be obnoxious or disagreeable to him or his heirs. If the chapel should by any means fail, the convent was to find a canon or secular chaplain to celebrate in the Church of Schefeld, and if the convent should attempt to procure the aforesaid chantry to be removed to the abbey or elsewhere, they were to be subject to excommunication, and to lose their mill. (This mill stood on a place now (1850) called Millhouses, in the Chapelry of Ecclesall.) Thomas de Furnival granted and confirmed to the abbot and convent his grange at Folwode (Fulwood, near Ecclesall), all the land belonging to the said grange, etc., for all their cattle, except goats. John Sheffield, the last Abbot of Beauchief, surrendered the house into the king's hands, February 4th, 1536, at which time the clear spiritual and temporal estate of the abbey amounted to £126 3s. 4d. On the 10th of April, 1537, Henry VIII. granted the site of the abbey, with the estate belonging

* Alfreton gave the surname of *de Alfreton* to the noble family of the founder.

to it, to Sir Nicholas Strelley, County Notts, for the sum of £223, and the description of the parcels then granted is (from an old translation of the Latin), "The house and site of the late Abbey or Monastery de Bello Capite, . . . and all the church, belfry, and churchyard of the same . . . also all messuages, houses, edifices, barns, stables, dovescotes, gardens, orchards, ponds, parks, land and soil within the site, circuit, or precinct of the late abbey . . . also 121 acres of arable land, 65½ of meadow, and 73 of pasture, with the appurtenances in Beauchief aforesaid . . . also all our Grange called Strawbereley, with the appurtenances in Beauchief aforesaid . . . and all houses, etc., which Thomas North holds to farm, and also all manner of woods, etc., etc., which John Sheffield, late abbot, held and enjoyed, which said church, lands, etc., etc., are of the clear yearly value of £12 8s. 3d., and no more . . . to be held of us in capite, by knight's service, viz., by the tenth part of the service of one knight's fee, and by the yearly rent of 25s. to be paid to us . . . in our court of augmentations . . . at Michaelmas only. . . Then the King of his bountiful grace, gives to Sir Nicholas Strelley all the revenues and profits of the premises from Michaelmas last, and he, moreover, was to have these letters patent without fee." The Strelleys never resided at the abbey, but dwelt at the Grange; when Edward Pegge, Esq. (who married Gertrude, the last of the House of Strelley, in 1648), came into possession of the property, he built the hall, with stone taken from the walls and enclosures of the abbey, but at the same time restored the chapel of the convent, which he fitted up and converted into the present Abbey Church, for the use of himself and the inhabitants of the liberty, and, as in the king's grant to Sir Nicholas Strelley, no provision was made for any religious service, he provided a clergyman at his own cost, as his successors have continued to do up to the present time. The Liberty of Beauchief is peculiar, being not only extra-parochial, but also extra-episcopal, and entirely free from any ecclesiastical jurisdiction whatever. It is bounded on the north by the Diocese of York, and on the west, south, and east by the Diocese of Lichfield. In a MS. at Beauchief Hall, in the handwriting of Edward Pegge, it is thus described: "The place where the abbie stands, and about 800 acres of the grounds adjacent, and belonging thereto are still known and called by that one common name of Beauchieffe, and are situated betwixt the Lordship of Eccleshall in Sheaf-field Parish on the north, the hamlet of Dore in Dronfield Parish westward, and the hamlets of Bradway, Greenhill, and Woodseats upon the south and east, within the Parish of Norton. Here at Beauchieffe, together with the abbie, was likewise built up a very spacious church, having a faire chancel, where was an altar, a large steeple, where were five bells, and likewise a cemeterium or churchyard, where (as also in the church) corps were interred whilst it was an abbie, and since . . ." In the church were the high altar of the Holy Cross, one of St. Katharine, and annimage of the Virgin Mary with a light. After the dissolution of the monastery, the abbey and domains at home went to Sir Nicholas Strelley; Alfreton to Sir Francis Leake; Fulwood and lands in Sheffield to the Earl of Shrewsbury; Edwalton to the family of Cavendish; Harewood Grange to Leake of Sutton; Walton to Foljambe; what the convent had at Chesterfield, Brampton, etc., to the Duke of Portland, which he exchanged for lands in Notts with the Duke of Devonshire; and Dronfield, Eckington, and Newbold to Fanshawe of Dronfield.

LIST OF ABBOTS OF BEAUCHIEF.

Jordanus, about 1231.
Gilbert, 1237.
Stephen.
Roger.
Ralph, 1285.
William de Folkingham, about 1312.
Robert de Radclyfe, 1350.
John Norton, 1393.
Robert, 1399.
Wm. Gresley, ob. 1433.
John Girdon, 1443.
John Downham, 1458.
John Swift, 1462.
John Swift 2nd, 1472.
John Norton 2nd, 1478.
Thomas, 1481.
John Norton 3rd, 1496.
John Greenwood, 1516.
John Sheffield, 1526.

POSSESSORS OF BEAUCHIEF ABBEY.

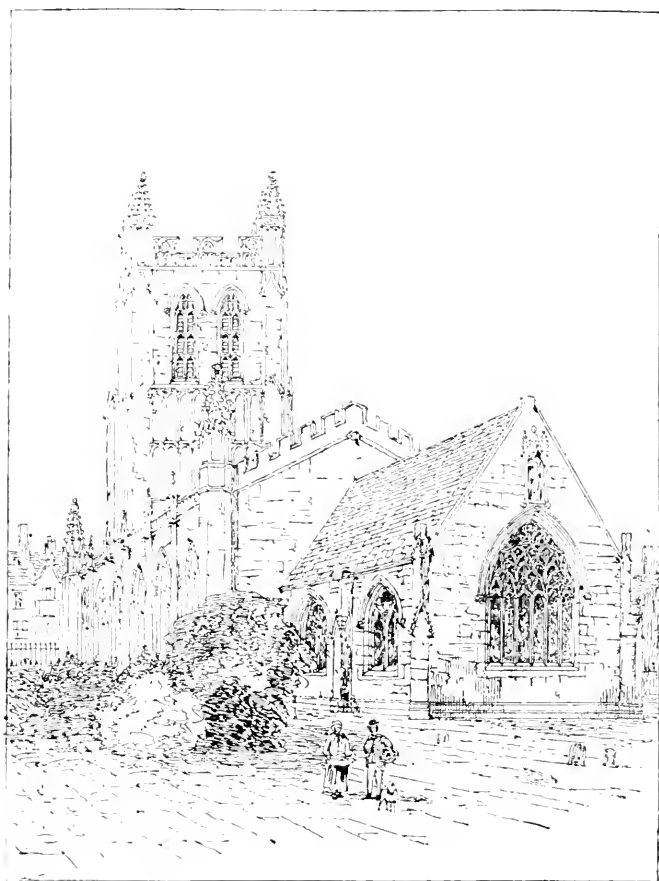
Sir Nicholas Strelley, had it granted to him in 1537.
Nicholas Strelley, Esq., succeeded his father in 1560.
Gervase Strelley, Esq., succeeded his father in 1602.
William Strelley, Esq., succeeded his father in 1607.
Gertrude Strelley succeeded her father in 1635.
Edward Pegge, Esq., married her in 1648.
Strelley Pegge, Esq., succeeded his father in 1679.
Christopher Pegge, Esq., succeeded his brother in 1691.
Strelley Pegge, Esq., succeeded his father in 1729.
Strelley Pegge, Esq., succeeded his father in 1770.
Peter Pegge, Esq., succeeded his father in 1774. (Mr. Pegge assumed the name of Burnell.)
Broughton Benjamin Stead, Esq. (who assumed the name of B. B. Pegge Burnell), succeeded his uncle in 1836.
Edward V. Pegge Burnell, Esq., succeeded his father in 1850.
Edward Strelley Pegge Burnell, Esq., succeeded his father in 1878, and is the present owner.

The 392nd Meeting was held at Stockport, on Wednesday, June 17th, 1896, at St. Mary's Church, at 5 o'clock.

The Rev. Canon SYMONDS, M.A., the rector, received a party of the members at the door, and guided them through this venerable and historical church. He described the architectural features, particularly calling attention to the beautiful and unique Piscina and Sedilia, the monuments and fine windows, and gave an account of the ancient parish, with some of its peculiarities.

The history of the town itself also had a short description; and then the Canon exhibited the fine old Communion plate and the well-kept registers

of this fine old church. Some noted graves were pointed out, and Mr. Wilde led the party to a fine old house in the market-place (hidden behind new buildings), with very quaint arrangements and some fine panelling and carving. Mr. Wilde also exhibited a large number of fragments of pottery and other remains, probably of Roman and Saxon origin.



STOCKPORT CHURCH.
(In the Market Place.)

The members then perambulated the town, viewing the site of the Old Castle (?), the Underbank, several old houses, the great Sunday school, the baths, the fine range of buildings in Wellington Road, and the great viaduct.

Very hearty thanks were tendered to the Canon and Mr. Wilde for their kindness in providing a very pleasant and instructive evening.



STOCKPORT BANK. (HITILE UNDERBANK.)

The 393rd Meeting of the Society was held at the Garden of the Venerable Archdeacon Anson, Birch, on Friday evening, June 19th, at 6 o'clock p.m.

The members were allowed to visit the church, and very much admired the commemorative mosaic of the Annunciation; and some information as to the old inhabitants and the history of the district was given. The gardens were then visited, with their wealth of hawthorn, azalea, and rhododendron in bloom, and the Archdeacon very kindly pointed out the end of Nico Ditch (which ends here in the Black Brook), and also the collection of four splendid specimens of *Osmunda regalia*, parsley, oak, and other ferns. One of the royal ferns was brought thirty years ago by the Archdeacon from Ingleton, and is still flourishing.

The venerable gardener knows all his flowers, and loves them, and is best pleased when others learn also to love them.

Very hearty thanks were given to the Archdeacon for his kind reception.

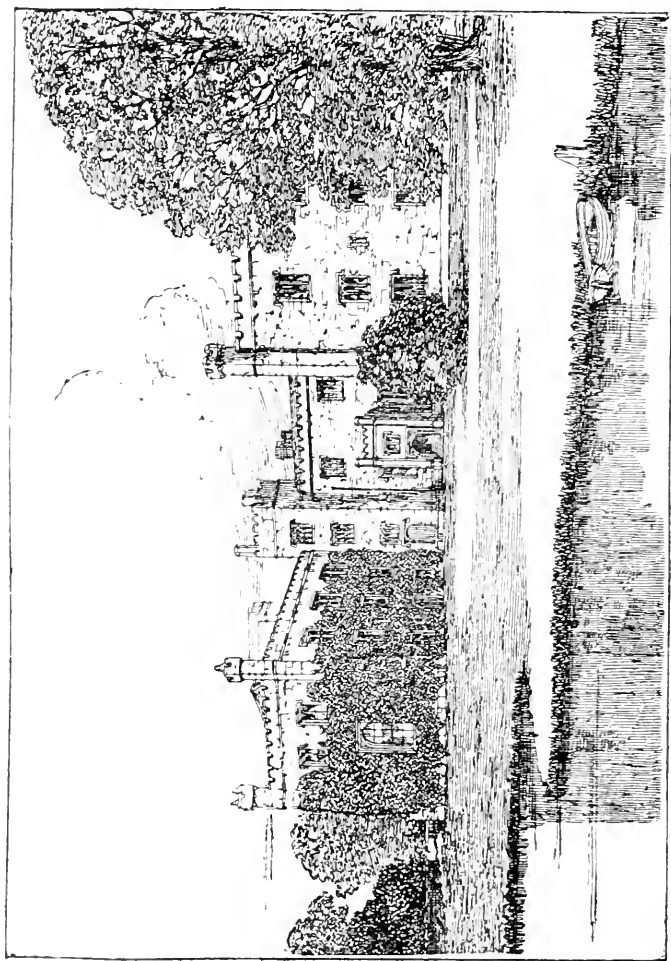
The 394th Meeting of the Society was held on Saturday, June 20th, 1896, at 6-30 p.m., at Mr. Gooding's, Bacup. Mr. THOMAS DENTITH in the chair.

A party of members were conducted by Mr. H. Bolton and the Rev. J. S. Doxey to view the Forest of Rossendale.

Mr. BOLTON admirably lectured to the Society, and his demonstration at the Manchester Museum had aroused interest in the forest, and this journey was entered upon for the purpose of enabling him to point out the

main geological features and points of interest within and surrounding the district.

Messrs. Roberts provided excellent horses and a comfortable brake, which took the members from Bacup, through the Thrutch, Waterfoot, Newchurch, Rawtenstall, Crawshaw, Goodshaw, Love Clough, Wholaw Nook (from which the whole of Cliviger and the flanks of Pendle could be



TOWNELEY HALL.

seen), Burnley, Burnley Wood (from which Towneley Park and the battlements of the hall were visible), Dirplay, Heald Town, Heylands, and Broadclough back to Bacup. The views on every side were very much admired, and the result of water action in the cloughs and valleys was pointed out by Mr. Bolton. The views to the north-east, over almost all Craven, were very fine, as the atmosphere was clear.

The Rev. Mr. Doxey took some of the members across the moors and rejoined the party at Crown Point.

The journey was thoroughly enjoyed.

A very hearty vote of thanks was moved, seconded, and supported by several members to Mr. Bolton, the Rev. Mr. Doxey (and to the host for their sumptuous repast), for their very kind attention to the members.* The resolution was carried unanimously. The Rev. Mr. DOXEY responded, and invited the members to the Scientific Society's Museum of Local Geology and Natural History. The specimens were explained by that gentleman and by Mr. Bolton, and then the party returned to the station. The books presented to the Society by Mr. Bolton, and Mr. Newbigging's works, were referred to with pleasure.



OLD INN, BROADCLOUGH, BACUP.

The 395th Meeting of the Society was held at Moreton Old Hall, Cheshire, on Saturday, June 27th, 1896, at 6 p.m.

A large company of members went by an early train to Congleton, and were met at the station by Mr. Wallworth, who very kindly acted as guide to the party.

Mr. Sheldon, the Town Clerk, received the party at the Town Hall, and exhibited the bells, the mace, charters, letters, and a variety of very interest-

* Since the meeting, it has been learned, with much pleasure, how the members were indebted to the Mayor of Bacup, and on behalf of all who were present, or would have liked to be, we gladly tender him our thanks.—EDITOR.

ing articles. He very kindly gave a most interesting description of them, and especially called attention to the most interesting items in the documents. Considerable time was spent in the examination of these most interesting relics, and very hearty thanks were tendered to the Town Clerk for his kindness.

Mr. Wallworth then led the party through the town, pointing out the most interesting buildings and relating to the members a number of curious stories of the place and people. The old silk mill, the beautiful park, with the portion of the old forest annexed to it, the old corn mill (the King's Mill), the bridge, and various houses of historic or of artistic interest were pointed out; and after lunch the members drove to Old Biddulph Hall and Church, and then returned to the station to meet the late comers.

The united party then drove to Astbury Church (where photographs were taken) and on to Moreton.

After a close and exhaustive inspection of this fine old moated grange, a hearty tea was partaken of in the Hall.

After tea, the Hall Keeper called the attention of the members to some curious old pewter plates, a fine collection of old china, and some famous round oak tables and other curiosities, her own property.

The return journey was duly made to the railway station, when the party found the train half an hour after its time; the result of this was that the party did not arrive at London Road until nearly half-past eleven. A most enjoyable day was utterly spoiled by this unfortunate ending. It is a disgrace to the L. & N. W. Railway that it should take two hours to run from Macclesfield, and if it often occurs will have a deterrent effect upon parties travelling by such a dilatory line: there can be no excuse for it at all.

At Moreton, after tea, a meeting was held, over which Alderman Bowes presided.

Dr. HAMILTON moved, Mr. G. BOWES seconded, a vote of thanks to our guide, which was supported and carried with great heartiness, and Mr. WALLWORTH responded.

A number of very fine photographs of the Hall were taken.

CONGLETON.

By Mr. ALFRED RIMMER.

CONGLETON is delightfully situated in a deep valley through which the River Dane runs. This river rises near the source of the Mersey, and forms for some distance the boundary between Cheshire and Staffordshire. It runs to the northern part of Somerford Park, and, passing between the grounds of Devonshire and Swettenham Halls, it flows to the River Weaver, joining the Wheelock, through which it passes by Middleton. Congleton has been largely rebuilt, but though not very much of its older parts remain, it is a very pleasant town. The viaduct is a fine one of ten arches, and crosses the valley at a very picturesque spot. There is a public park, through which the River Dane passes, and this is not only well planted, but it joins a wood of about ten acres which was scheduled in Domesday Book. This park was purchased by the Corporation in 1865, and it should be an attraction to the quiet old town, as there are boats on the River Dane that may

be hired at a very moderate rate. Formerly, Congleton was more lively and busy than now, as the great highroad from London to Liverpool passed through it, and it was the resting place daily for a hundred horses. Congleton, at a very early time, belonged to the Ardernes, a family that held many domains in Cheshire. The branch of the Ardernes who owned Congleton became extinct at the death of John A. Arderne. The property then passed to the Earl of Lincoln, as being the nearest of kin, and it even fell into the hands of royalty, being afterwards vested in the Shakerleys. Sir Charles Shakerley is now the lord of the manor. Near the railway station is a house called Parnell's Croft, where Mr. Parnell (afterwards created Lord Congleton) lived. To his family the late Mr. Parnell belonged. The third Lord Congleton served at the Battle of Navarino. In the Town Hall there is a rather amusing specimen of a great mace. It measures some three feet six inches in length, and is very elaborate. It was made in Cromwell's time, and every kind of royal emblem was carefully avoided; but on the accession of Charles II., in 1660, the mace was altered. Royal emblems were screwed on to it, and there is an inscription: "The freedom of England by God's blessing restored to C.R., 1661." There is a memorandum in the Corporation accounts that this cost in all £3, which in those days was a considerable sum for such a purpose. Congleton has a rather fine specimen of a "brank," or scold's bridle; Macclesfield has another somewhat similar. These were formed of iron loops put over the head, and a piece of iron entered the mouth, which, of course, made speaking impossible. These "bridles" were not quite out of use so late as 1832. At one of the Chester Archæological Society's recent gatherings a very remarkable one was shown which was lent from Manchester. The exhibitor said: "It was formerly used in the Manchester Market to control the energetic tongues of some of the female stall-keepers, and retained its original coverings, consisting of alternate white and red cotton bands, which terminate at the upper part in a loose bunch of the same material."

The old inn is a very good example of black-and-white architecture. A slight alteration has been made in the little wing that joins the porch, which is apparently new; but this is only to make it suit the other parts of the front. The Lord of the Manor of Congleton, Sir Charles Shakerley, lives at Somerford Hall, in the district of Astbury; he has another seat, called Park Place, in Berkshire. The family dates back to the time of Henry III. Clement Swettenham, who was lord of the manor at the beginning of the present century, held a commission in the 16th Dragoons. He served under the Duke of Wellington in the Peninsular War and at Waterloo. His son, Edmund Swettenham, it may be remembered, contested Carnarvon in 1886, and, though this is a very Liberal constituency, he gained the seat as a Conservative. He died unexpectedly, and Mr. Lloyd-George recovered the seat for the Liberals in 1890 by a majority of 18, which was increased at the election of 1892 to 195 votes. There is a slight confusion of names in the district around Congleton. There is a very old family of Swettenham, of Swettenham Hall, who were seated here before the Conquest, and have many interesting records. There is an heirloom in the family—the watch that belonged to Lord William Russell, who was executed. When on the scaffold he handed his watch to an ancestor of the Swettenhams, and said: "I am now done with time, and must henceforward think of eternity."

LITTLE MORETON HALL, CHESHIRE.

THIS ancient hall is one of the most interesting of the half-timbered mansions of Cheshire. We shall chiefly follow the account which Lyson has given, adding some supplementary particulars. It is a remarkable building, almost wholly of timber; and from the singularity of its form and its high state of preservation, is more deserving of attention than any other of the same kind in this county. There is a moat round the hall, which occupies three sides of a court, on the north side of which is the hall, with a large bow-window, being five sides of an octagon. On the east side of the court is a chapel, on the walls of which are painted various inscriptions in text-hand, and ornaments. The entrance is on the south side, over a stone bridge, across the moat. The whole of the upper part of this side of the building, being sixty-eight feet in length, is occupied by a very light gallery, having a continued range of windows on every side of it. The timber-work of this building, and the glazing of the windows, are each remarkable. Over the great bow-window of the hall are the following inscriptions, carved in wood-work, together with the arms and crest of Moreton: "God is al in al thing." "This window whire made by William Moreton in the yere of oure Lorde MDLIX." "Rychard Dale Carpéder made this window by the grace of God." It is probable that some parts of the building, especially the chapel, might have been of an earlier date.

The William Moreton just named occurs 5th Henry VIII., in an award between him and Thomas Rode, by Sir William Brereton, to whose decision an important dispute was left by George Bromley, senior justice of Chester, who had been joined with him in arbitration. The dispute was, "Which should sit highest in the churche, and foremost goe in procession." And the said Sir William Brereton awarded the honour to the gentleman "that may dispense in lands by title of inheritaunce ten marks or above the other."

The family, however, is said to have settled in the neighbourhood since the reign of King John.

The chancel of Astbury Church, near Congleton, Cheshire, is a chapel or aisle belonging to the Moretons of Moreton Hall. In it, or in the chancel, were formerly two recumbent figures of Crusaders, members of the ancient family of Moreton. They have been entirely removed, and cannot now be found. This is now discredited by local antiquaries.

In 1867 the large altar-tomb, which used to stand in the chancel at the end of the north aisle, covering the remains of Sir William Moreton, as well as those of his mother and wife, had been taken down, and the slabs let into the pavement. Two hatchments, fixed to the east wall above it, one of them that of Sir William Moreton, had been removed. Sir William, who died in 1763, was Recorder of London, and was the last male descendant of the ancient family of Moreton, of Little Moreton, though the descendants in the female line are yet existing. At Christ Church, Oxford, is a fine portrait of the Right Rev. William Moreton, Bishop of Kildare, and afterwards of Meath, the father of Sir William Moreton.

These are some of the many features of interest, architectural and archæological, that cluster round Moreton Old Hall.

The 396th Meeting was held at The Manchester Museum, Owens College, on Wednesday, July 15th, 1896, at 4-30 p.m.

A large number of members met at the Museum to inspect the Flinders Petrie collection of Egyptian antiquarian relics. The officials received the members and explained the interesting collection.

The visit was very much enjoyed by the members, and very hearty thanks were tendered to the Museum officials for their kindness.

The 397th Meeting was held at Mr. T. Dentith's House, Dobcross, Saddleworth, on Saturday, July 25th, 1896, at 6 p.m. The Rev. Mr. EDWARDS in the chair.

Mr. H. T. CROOK, C.E., led a large party of members from Diggle Station to the site of the new volunteer ranges, and explained the proposals that it was intended to carry out for the benefit of the volunteers.

Mr. T. DENTITH led the party to see a large water-wheel at Messrs. Lawton's mill, who had kindly given permission for the visit. The wheel was built at the beginning of this century, and gives about 400 horse power for turning the mill machinery. It is an overshot wheel, and is said to be the largest water-wheel in Great Britain. It is about 64 feet in diameter. The man in charge of the wheel turned on the water and allowed the members to see it working. He stated that the repairs to the wheel had been very small and insignificant. The existence and long successful working of so powerful a machine in this retired Yorkshire valley was quite a surprise to many members.

The members were then led by somewhat damp paths to Dobcross, and again enjoyed the hospitality of Mr. and Mrs. Dentith.

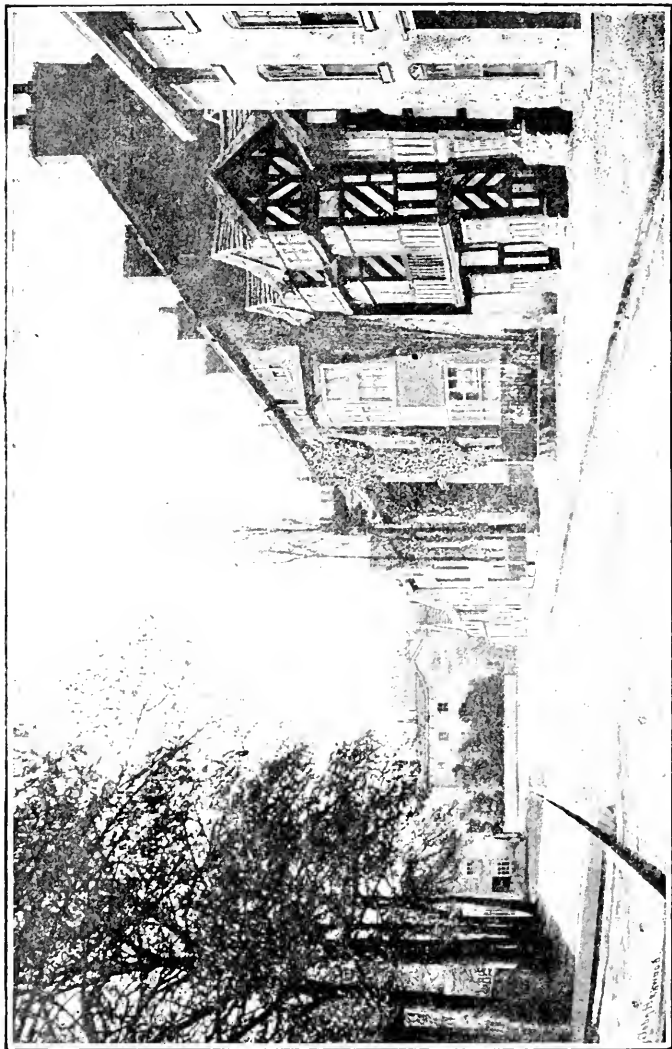
Votes of thanks were passed to Mr. and Mrs. Dentith, Mr. H. T. Crook, and Messrs. Lawton.



PRESTBURY CHURCH.

The 398th Meeting was held at The Black Boy, Prestbury, on Saturday, August 15th, 1896, at 5-30 p.m.

Carriages took up the party at Macclesfield Station, and drove through Macclesfield to Gawsworth, thence to Marton, where a halt was made, and the old timbered church and the remains of the famous old oak were photographed. The journey was then resumed through Siddington, Capes-



PRESTBURY, FROM THE NORTH.
(The old Puritan preaching house is the low magpie house on the right hand in the foreground)

thorne, Monks' Heath to Birtles, where another halt was made for the purpose of inspecting the unique Birtles Church. Driving through Over Alderley to Prestbury, tea was provided, and votes of thanks were passed to the leaders.

After tea the members strolled about the village, examining the architectural features of the church and old houses, and the antiquarian remains. The fine weather added to the enjoyment of the members.

The 399th Meeting was held at Unsworth, on Saturday, August 29th, 1896, at 6 p.m.

Mr. DANIEL FLETCHER, C.C., invited the Society to visit him at Back-o'-th'-Moss, and conducted the party over the neighbourhood, explaining the topographical features of the district. After the tour, the members returned to the house and enjoyed the hospitality of Mr. and Mrs. Fletcher.

Very hearty thanks were passed to Mr. Fletcher for his guidance, and to Mrs. Fletcher for her hospitality.

The 400th Meeting was held in the Lord Mayor's Parlour, Town Hall, by permission of the Lord Mayor, on Friday, September 4th, 1896, at 3 p.m. The Right Honourable the LORD MAYOR in the chair.

His Excellency Sir W. E. MAXWELL, K.C.M.G. (Governor of the Gold Coast Colony), addressed the Society on "The Gold Coast" (See page 37), illustrating his address with large maps, hand maps prepared by the Victorians, and a large collection of photographs of Western Africa, the property of the Society. Lady Leech placed on the table for inspection a number of photographs from her son at Bonthe, Sherbro Island.

Alderman Sir BOSDIN LEECH, J.P., moved a very hearty vote of thanks to His Excellency, which was seconded by Mr. W. H. HOLLAND (President of the Chamber of Commerce), and responded to. A vote of thanks was passed to the Lord Mayor, to which he replied.

The 401st Meeting was held at the Queen's Hotel, on Friday, September 4th, 1896, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

His Excellency Sir William Maxwell was entertained at dinner by the Society, and there was a large gathering of members.

The CHAIRMAN proposed the toasts of "The Queen and the Royal Family," referring especially to the President of the Society, H.R.H. the Duke of York. These toasts were duly honoured.

The CHAIRMAN then proposed "The health of the guest of the evening, Governor Maxwell."

HIS EXCELLENCY responded, and proposed "The Prosperity of the Town and Trade of Manchester and Salford." The MAYOR OF SALFORD and Mr. W. H. HOLLAND responded, and Mr. GEORGE HOLT (Chairman of the African Section of the Liverpool Chamber of Commerce) responded for Liverpool.

Mr. SYDNEY KEYMER proposed "The Health of the Chairman," and Mr. STEINTHAL responded.

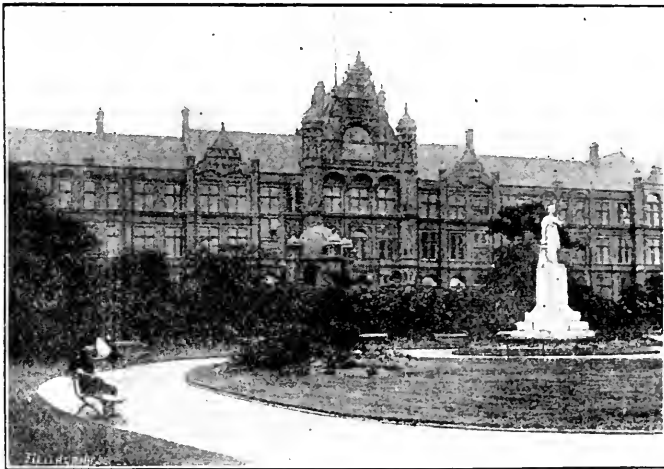
Mr. REUBEN SPENCER then proposed "The Manchester Geographical Society," to which the SECRETARY replied.

The 402nd Meeting was held at the Royal Technical Institute, Salford, on Saturday, September 26th, 1896, at 5 p.m. Mr. Alderman ROBINSON (Chairman of the Technical Committee of the Salford Corporation) in the chair.

A large number of members accepted the invitation to inspect this new and handsome Institute, and were conducted through the various rooms by Mr. W. Wilson, M.A., the principal, Mr. R. Martin, the secretary, and by His Worship the Mayor of Salford.

The class rooms, teachers' rooms, laboratories, art rooms, models and appliances were closely examined, and adjournment was made to the fine lecture room to hear a selection of music by Councillor Phillips, on the organ presented to the Corporation by Mr. Lees Knowles, M.P., after which refreshments were offered to the members by Alderman Robinson.

A number of questions were asked and replied to, and the Rev. S. A. STEINTHAL moved a vote of thanks to the Committee for their permission to visit the Institute, to His Worship the Mayor for his kindness in attending, to Alderman Robinson for his hospitality, and to Mr. Wilson, Mr. Martin, and Councillor Phillips. Alderman BOWES seconded the resolution, and Alderman ROBINSON responded.



THE ROYAL SALFORD TECHNICAL INSTITUTE FROM PHEL PARK.

THE JOURNAL

OF THE

MANCHESTER GEOGRAPHICAL SOCIETY,

THE NORTHERN CAPITALS OF EUROPE.

By MR. J. C. BLAKE, F.R.G.S., F.I.Inst.

[Addressed to the Society on Wednesday, November 27th, 1895.]

THE BALTIC AND NORTHERN RUSSIA.

ON the present occasion our party, numbering 102, all first-class passengers, was under the direct leadership of Mr. Perowne, who had chartered the steam yacht "St. Sunniva," 1,000 tons, for a cruise of 24 days to the northern capitals, including an extension to Moscow, the former capital of Russia.

Leaving Leith about 7-0 p.m. on Monday, the 13th May, we soon begin to form new acquaintances amongst our fellow passengers, who, as may naturally be expected, are of a thoroughly representative type. We were particularly fortunate in the weather, hardly a ripple disturbing the sea from the time of our departure to the day of our return.

Notices were posted almost daily in a prominent position on the upper deck by the conductor, for the information of passengers on all matters in which they were concerned—such as, for instance, the leading places and objects of interest to be visited at our next place of call, and the hours during which they are opened to the public; time of departure of trains or other conveyance therefrom to local places in the neighbourhood. By this means full advantage could be taken by passengers of the time arranged for each call, and upon all occasions most of them also took advantage of the ever ready and useful little steam launch which our courteous captain allowed to go ashore at any time of the day, with only one passenger if required.

Steaming down the Firth of Forth, our course lay almost direct across the North Sea, and after passing the Naze, the southern extremity of Norway, we enter the Skager Rack (the crooked strait of the Skaw) between Norway and Jutland. On the left hand or western shore, we pass many interesting and thriving seaports, Christiansand, Grimstad, Arendal, Kragero, Laurvik, at which all the coasting steamers and others from England, Scotland, Germany and Denmark touch regularly. Off Laurvik we enter the magnificent Fjord of Christiania, which stretches northward for 65 miles. Nearly opposite is Frederikskald, at the mouth of the Glommen. When besieging its fortress of Frederikstein, Charles XII., of Sweden, was killed in 1718.

VOL. XII.—Nos. 10-12—OCT. TO DEC., 1896.

After passing Tonsberg and Horten on the left, we enter a wide bay, and are now in perfectly smooth water. On the west is the entrance to Drammensfjord, at the head of which is Drammen, one of the chief ports for the exportation of timber, and of zinc and nickel from Skouger and Ringerike, the annual value of the timber alone exceeding £250,000. Passing the entrance to Drammensfjord, and continuing our course along the bay in a north-easterly direction, it gradually narrows to a strait, with picturesque villages and softly beautiful scenery on both sides, and beyond this strait, which is about 20 miles long, there is another wide bay with numerous islands, the banks of which are covered with the charming villa residences of the merchants of Christiania. Here the fjord is like an inland lake, the waters, which are beyond the reach of the tides, being always at the same level and of a brilliant blue colour. At Christiania, the northern limit of the fjord, it is divided by a tongue of land into two bays—the Pipervik in the west, and the Björvik in the east. Opposite the custom house on the latter the “St. Sunniva” lands her passengers about noon on the 15th, the passage of 500 miles occupying about 40 hours.

CHRISTIANIA.

Christiania, beautifully situated at the head of Christiania Fjord, about the same latitude ($59^{\circ} 54' N.$) as the south of the Shetland Islands, has been the capital of Norway since 1624, when Oslo, the former capital, after various misadventures, was finally destroyed by fire. The same year Christian IV. (hence the name Christiania) of Denmark laid the foundation of the modern town. In 1686, 1708, and 1858, it suffered severely from conflagrations. The most ancient capital is Trondhjem, and there the constitution of 1814 requires the kings of Norway to be crowned.

The population of Christiania (almost entirely Protestant) in 1891 had reached 150,444. In addition to its extensive shipping there are, in the immediate neighbourhood, several considerable engine works, breweries, cotton mills, and paper factories, most of which lie on the banks of the little river Akers-Elv. The city is amply supplied with electric-light, also tramways and omnibuses, and the people generally appear to display an air of energy, manly freedom, and intelligence—which admirable qualities are, I think, possessed by the Scandinavian race generally—the result being a profitable development of the resources of the country, and, aided by a well-ordered self-governing power, producing the natural result—all-round prosperity.

The King of Sweden and Norway has a palace here, pleasantly situated at the head of Karl-Johans-Gade, west end of the city, built in 1848, and surrounded by beautiful parks and gardens. Opposite the main entrance is an equestrian statue of Bernadotte (Charles XIV.), inscribed with the king's motto—“The people's love is my reward.” At the opposite end of the same noble street is the Stortings-Bygning, or Houses of Parliament—a semi-Byzantine building, completed in 1866, containing two houses and the usual committee-rooms, etc. To the larger house, called the Storting-Sal, accommodating 150 members, we were courteously admitted to the strangers' gallery in the forenoon, during the progress of a debate, the hours of sitting being from 10 a.m. to

5 p.m. The smaller house, called the Lagthings-Sal, has seats for 40 members.

The University, founded by Frederick VI. of Denmark, in 1811, is a classical building, completed in 1853 by the addition of two wings at right angles. There are five faculties, with about 50 professors, and 1,000 students, who are educated free, with the exception of a small entrance fee. At the back of the court of the central building may be seen an interesting specimen of the old Viking ships, dug out of a mound near Sandefjord in 1880, with mast, oars, rudder, and metal vessels, all in a good state of preservation, doubtless attributable to the blue clay in which it was found embedded. The ship measures 103ft. over all, and 16ft. broad, the length of keel being 66ft. In the third plank from the top are 16 rowlocks. To the mast in the centre a large square sail was attached by means of a pulley. Near the mast was the tomb chamber, which was found empty, having doubtless been pillaged at an early period.

The old Fortress of Christiania, called the Akershus, on the east bank of the Pipervik or western harbour, is well worth a visit. It was unsuccessfully besieged by Duke Erik of Sweden in 1310, by Christian II. of Denmark in 1531-2, and by the Swedes again in 1567, and in 1716, under Charles XII.; it is now used as an arsenal and prison. The ramparts are also now used for a totally different purpose, being extensively resorted to by all classes as a promenade, affording most charming views of this side of the fjord.

Amongst the many interesting places in the neighbourhood of Christiania, mention must not be omitted of Oscarshall, a royal chateau situated in a wooded park two miles west of the city, on an eminence overlooking the fjord, on the east shore of the peninsula of Lodegaardsø. Belonging to the Government, it was completed in 1852, and contains numerous paintings of Norwegian scenery and peasant life in the dining-room, but it is much to be regretted that the damp walls appear to receive little attention. From the top of the tower a magnificent view is obtained for many miles of the fjord and its numerous beautifully-wooded islands, also of the city and its surroundings. Christiania possesses an excellent Museum, containing sculpture and the national gallery of paintings, besides an Art Union and Industrial Museum; also numerous churches, one of which, St. Olaf's (Protestant), dating from 1080, is considered one of the oldest in Norway, and was restored in 1861.

COPENHAGEN.

Leaving Christiania we reach Copenhagen on the afternoon of the 18th—our course being a straight run of 270 miles—almost due south. After crossing the eastern end of the Skager Rack we enter the Cattegat (Cat's Throat), which separates Denmark from Sweden—passing the Skaw (Norse—*Skagar*, a promontory), opposite the extreme end of which is a lightship.

Entering the Sound between the island of Zealand and Sweden, we pass, within sight, the famous Elsinore (or Helsingör) guarded by the Castle of Kronberg, the scene of Hamlet. On the flag battery of this grand old castle Shakespeare represents the ghost of the Danish King as wandering past the guards, and to English tourists it is generally known

as Hamlet's Castle. The Sound is here only three miles wide, and at Copenhagen it is from twelve to thirteen.

We anchor in the New Harbour—adjacent to the Custom House landing stage, and again welcoming the pleasant change of going ashore, drive in and about the city for a couple of hours to form an idea of the principal streets, thoroughfares, and squares.

The following day we visit the Thorwaldsen Museum, a sombre edifice completed in 1848, in the style of an Etruscan tomb, and much out of repair. The museum contains the finest works of this great Danish sculptor, including originals in marble, plaster models, designs, etc., also a portion of his furniture and household effects, whilst his remains are interred in the centre of the inner quadrangle.

In the centre of the city is the large open square, called the King's New Market, possessing all the bustle and importance of a continental capital, and at night it is brilliantly illuminated by electric light.

On one side of this square stands the Grand Theatre or Royal Opera House, a handsome building, completed in 1874, and capable of holding 1,500 persons.

Copenhagen contains many imposing public squares, which seem to abound in monuments, amongst these being the equestrian statue of Frederick V., in the square called the Amalieborg, the four sides forming palaces, occupied respectively by the King, the Crown Prince, the Foreign Office, and the Court of Justice.

The Christiansborg Palace, situated on an island to the south of the main city, is the largest and most conspicuous building in the city. Destroyed by fire in 1794 it was rebuilt, and again, unfortunately, destroyed by fire in 1884, and is to be afterwards rebuilt in an altered form. In front rises the equestrian statue of Frederick VII., the founder of the constitution—1848-1863—and around the statue are placed allegorical figures of Strength, Wisdom, Health, and Justice, from designs by Thorwaldsen. Fortunately the south-east wing of the Palace, containing the Royal Library, with 550,000 volumes and upwards of 20,000 manuscripts, escaped the flames, as also did the Court Chapel and Royal Stables.

Close to this palace may be seen the Borsen, or Exchange, erected in 1619 to 1640, with a spire 165ft. high, the top of which consists of four dragons with entwined tails. In 1858 the merchants of Copenhagen purchased this remarkable building from the Government.

The Palace of Rosenborg, which we visit, is a simple but effective edifice, built by Christian IV. in 1604, whose favourite residence it became, and was afterwards made use of by successive Danish monarchs as a depository of jewels, state weapons, coronation robes, uniforms, and other valuables. This collection has been since supplemented from other palaces, and arranged in chronological order down to 1863, and now forms an admirable historical survey of the advance of art and culture in Denmark.

A favourite excursion from Copenhagen is to the Dyrehaven, or deer park, a beautiful forest of very fine beeches, and containing large numbers of stags and deer. After a pleasant drive of about six miles the entrance to the forest is reached, and about two miles further, on a height, in a clearing of the wood, stands the shooting lodge built by Christian VI. in

1736, near which, towards evening, the greater part of the deer appear to collect, amounting to several hundreds. From here the road leads through the wood of Jagersborg to Skodsborg, a favourite bathing place, possessing a good landing pier for the steamers, and the most beautiful spot on the Sound.

The people of Copenhagen may be justly proud of their capital, and its excellent harbour formed by the strait, to which, no doubt, the city is largely indebted for its early prosperity in trade, as indicated by the Danish for Copenhagen—*Kyobenhavn* or *Kobenhavn* (merchants' harbour)—which has been so largely extended of late years.

Up to the year 1870 the city was fortified on the side next the sea only, but fortifications are now in course of progress on the land side also.

It may be mentioned that the keenest interest was felt in the arrival at the different capitals of so unprecedented a number of Englishmen. Several of our party were presented to the Crown Prince of Denmark at Copenhagen, who was greatly interested in our programme. In St. Petersburg and Moscow, also, our arrival was alluded to in the daily papers.

STOCKHOLM.

Leaving Copenhagen about midnight on Sunday, the 19th, after a beautiful day at sea on Monday—a run of 450 miles—brings us to Stockholm, the capital of Sweden, in about 34 hours. Our course at first is almost due south, past the strongly-fortified seaport of Malmö, on the eastern shore of the Sound. Malmö contains 47,000 inhabitants, and possesses considerable manufactories of gloves, etc.

We then round Falsterbo, the most southerly point of Sweden, and enter the Baltic; then eastward between the mainland and the island of Bornholm—an island of about 35,000 inhabitants—to the south-east of the Swedish mainland and belonging to Denmark.

Turning north-east we pass Karlskrona, the chief station of the Swedish navy, consisting of several islands and a population of about 20,000. We then sail through the narrow Kalmar Sound, between the mainland and the island of Öland. Kalmar is a very ancient town, with 12,000 inhabitants, and lies partly on the mainland and partly on two islands in the Sound. In 1397 Kalmar, which used to be called "*Rikets Nyckel*" (the key of the kingdom), witnessed the conclusion of the Kalmar Union, by which the three Scandinavian kingdoms were united for a century and a quarter. We then pass Gothland, the largest island in the Baltic, about 70 English miles in length, and from 20 to 35 in breadth, with a population of about 52,000, whose occupation is chiefly that of agriculture and cattle breeding. The horses and sheep of Gothland, both highly prized, are allowed to run wild in summer. The greater part of the island is fertile and well cultivated. The climate is mild; trees flourish; and the venerable walls of Visby, its capital, are luxuriantly clothed with ivy. Quarrying and lime burning are amongst the other resources of the island.

The approach to Stockholm for several miles is varied by numerous small and beautifully wooded islands, situate on Lake Mälar, an arm of the Baltic, the trees extending in many cases down to the water's

edge, the water itself being perfectly smooth and clear, and as the morning was bright and sunny, the tender green foliage was seen to full advantage. These islands not unfrequently appeared in the distance to bar the further progress of the vessel, but on a nearer approach, a gentle deviation to the right or left enabled us to continue our course, every turn appearing to develop pictures of extreme beauty and loveliness. On a nearer approach to Stockholm, many of these islands, and also both sides of the mainland, contained picturesque villas erected on the sloping ground, peeping out amongst the trees—each with its boathouse and bathing-house, the boats generally being moored close up under the overhanging trees. These villas are mostly occupied during the spring and summer only, the whole expanse of water being frozen during the winter.

Stockholm stands partly on islands, connected by substantially built bridges, which do not appear to impede the busy traffic of innumerable ferry steamers, constantly engaged in the conveyance of passengers until a late hour of the night, thus serving the purpose of cabs and omnibuses for the public.

The island of Staden forms the old part of the city, situate at the mouth of Lake Mälar, the water of which is all fresh, and connected with the north suburb of Norrmalm by a handsome bridge of seven granite arches completed in 1797, and with the south suburb of Södermalm by the sluice bridge. There are also the islands of Riddarholmen on the west, and Helgeandsholmen on the north—the oldest part of the city—whilst away to the east again is the suburb of Skeppsholmen with its quay and landing place for steamers, and extensive shipping and warehouses, and here, almost midway between the sites of the Royal Palace and the National Museum, the “St. Sunniva” anchors about four hundred yards from the former building, which is a handsome rectangular one. The Royal Palace, situate at the north-east of Staden, was completed in 1760, being interrupted by the wars of Charles XII. The central quadrangle, entered from three sides, is open to the public, but the north-east portal, from which a private flight of steps descends to the Logard, affording a fine view of the harbour from its entrance, is reserved for the royal family. The private apartments are shown daily in summer during the absence of the royal family, while the public rooms are open daily throughout the year. We were courteously conducted through the grand gallery, privy council room, grand banqueting saloon, the Seraphim saloon (for the Knights of the Seraphim Order, the highest in Sweden, founded in 1748), and the Riks Sal, or Imperial Hall, where the ceremony of opening the Representative Chamber takes place, being surrounded with a gallery, a portion of which is occupied upon the occasion by members of the royal family and ministers of state.

The National Museum is a large and very handsome building, completed in 1866. Over the portal are medallion reliefs of famous Swedish scholars and artists, including Linnaeus the botanist. The collections are extensive and interesting, including the historical museum and cabinet of coins, the industrial art collections, and antique and modern sculpture, and the picture galleries, including drawings and engravings. Upon the occasion of our visit the museum was closed for the purpose of cleaning, and I would here thank Mr. Erik G. Foleker, one of the

custodians, for not only making an exception in our favour in admitting us, upon seeing we were foreigners, but for his extreme courtesy in conducting us personally through the various galleries, and explaining to us in English many of the leading exhibits.

Opposite the south-east entrance of the palace is an obelisk, erected in 1799 by Gustavus IV., in memory of the citizens who fell during the war against Russia in 1788-90, while the nobility were hostile to the sovereign, and close by stands the monument of Gustavus III., erected in 1808, by subscription, in honour of that adventurous monarch.

The Riddarholms-Kyrka, with its lofty and conspicuous spire of cast iron, 290ft. high, was founded in 1264, and rebuilt in 1743; this church has for centuries been the burial place of the Swedish kings and heroes, but divine worship has not been performed since 1807, except in the case of royal funerals. The walls of the church contain coloured armorial bearings of the deceased Knights of the Seraphim Order, including those of the German Emperors, William I. and Frederick III., the pavement being formed of tombs.

We also visit the Academy of Science, of which Linnæus, the famous botanist, was the first director, also the Northern Museum, containing an extensive and magnificent collection of Scandinavian curiosities.

An excellent view of the city may be had from the steam elevator. There are two lifts—one on each side of the central column—so arranged that they balance each other, one going up whilst the other is descending. A charge of about three-farthings is made to ascend, and only a half-penny to come down. The object of the elevator is to reach the higher level streets without resorting to the roundabout route in the steam trams.

From the top of the elevator the most prominent object is the Cathedral of St. Nicholas, the tower of which is 184ft. high. Below us are the busy quays, and in the centre of the Karl Johan's Torg is a fine equestrian statue of Bernadotte. To the left is the Mälar Lake, which is about a foot higher in level than the Baltic, and you can see the locks for vessels leaving or entering the lake.

In another view from the elevator, looking down again at the other end of the locks, we observe the drawbridge is up for a vessel to pass out into the Baltic. Beyond are the quays for the sea-going steamers. Immediately in front of us is the new museum and picture gallery, previously alluded to, and to the right of the picture is the long bridge called the Skeppsholmen Bro, leading to the island on which is the chief military and naval depot, and the fine church of Carl Johan. Just below us is the fish market, composed of floating pontoons reached by gangways. The stalls have awnings, and the fishing boats bring their cargoes right into the market. Our vessel was anchored not far from here, and we occasionally ran through with the launch to witness the proceedings at "high change," which were very amusing.

The suburbs of Stockholm are extremely pretty, and contain numerous parks and gardens, mostly approached by well-constructed and commodious ferry steamers, running at frequent intervals. Here may be seen small zoological collections, open-air theatres, gymnastic and aerobatic performances, all of which are largely patronised by the citizens in fine weather, and which also afforded us amusement of a light and varied character, as an agreeable change from ship life.

Many very enjoyable steamboat excursions may be taken daily from Stockholm, including Gripsholm, the castle of which, built in 1537, with its four towers, on a clear day, is beautifully mirrored in the pellucid waters of the Mälar.

Gustafsberg is another attractive spot, about 10 miles east of Stockholm, and is approached by steamer, occupying about two hours in a passage leading through a labyrinth of richly-wooded islands, amongst which, at intervals, may be seen picturesque villas. Steaming down the fjord the vessel emerges from between these islands, and suddenly, after passing through a narrow and rapid course under projecting cliffs, the lake opens out and expands to a width of several miles, the numerous picturesque landing stages along its margin being especially pretty. Gustafsberg is a small village at the head of the bay, containing an important porcelain factory for the manufacture of parian and biscuit china with pale ornamentation, to which the public are admitted.

Leaving Stockholm on the 24th, after a pleasant stay of three days, and crossing the Baltic, the vessel sails up the Gulf of Finland to St. Petersburg, a course of 300 miles almost due east. This being the anniversary of the birthday of Queen Victoria, the usual loyal toast was drank at sea after dinner—shortly after leaving Stockholm.

At the southern entrance to the Gulf of Finland is the province of Esthonia, which, along with the adjoining province of Livonia, was given up by Sweden to Russia in 1721 at the peace of Nystad. By the terms of the capitulation, which preceded that treaty, the Protestant religion and the German language were guaranteed, as well as all ancient rights and privileges.

An ukase of 1885 now requires the use of the Russian language in all official transactions and correspondence, and since 1889, new Law Courts have been established throughout the three Baltic provinces, which include Comland.

The capital of Esthonia is the strongly fortified seaport of Revel, with a population of 51,000, and an extensive export trade in corn, timber, hemp, and hides.

HELSINGFORS.

On the opposite coast is Helsingfors, the capital of Finland, with a population in 1892, of 70,000, including the garrison, this place also being very strongly fortified, and well protected by the first-class fortress of Sveaborg, on which 900 cannon are mounted, its garrison being 5,000 men on a peace footing, and 10,000 in time of war. The works are built on seven islands, and from their extent, and the strength of the position, Sveaborg has been called the Gibraltar of the North. These islands are very pleasantly situated, but unfortunately time did not allow us to land, although excursions are frequently made, but the permission of the Commandant at Sveaborg must be obtained (on the spot) in order to visit the works.

Considerable intercourse exists between Helsingfors and Stockholm, about twenty-four hours being occupied by steamers in the passage.

I very much regret not being able to speak of Finland at greater length, but a few words about the Grand Duchy may be of interest. Being extensively covered with water, it bears the poetical designation

of the "Land of the Thousand Lakes." In 1890 the population of Finland amounted to 2,338,404. Finnish is spoken by about 85 per cent, and Swedish by 14 per cent. About 6,000 inhabitants (excluding garrisons) use the Russian language, 2,000 the German, and in the extreme north there are 1,000 Lapps.

The superficial area of Finland is 144,255 English square miles. About 85 per cent of the people are peasants, but there is scarcely a man or woman of the Lutheran faith who cannot read the Bible, an excellent system of education being carried out under the superintendence of the Lutheran clergy, who exclude all who are unable to read or write from the sacrament.

In 1886 the number of children instructed at Sunday schools and at home was 205,000, and the total number of pupils in the higher schools, lyceums, elementary schools, etc., was about 11,000 in 1889-90.

The primary (national) schools were during 1889 and 1890 attended by 69,739 pupils, the total number of children under tuition, either in schools or at home, being over 400,000. The national schools of Finland have attracted the attention of specialists mainly because earlier than in any other country instruction in handicrafts has been introduced in them.

The University of Helsingfors in 1891 numbered 1,738 students, including 30 women.

The revenue of the Grand Duchy, according to the budget of 1891, amounted to about £2,200,000, and the expenditure to about £1,500,000, while the present total of the public debt is about £3,280,000.

The government of Finland is vested in a Diet, which possesses the right of initiating legislation, in common with the Emperor Grand Duke, in accordance with a revision in the constitution made July 16, 1886, but by a law passed previous to this, in 1867, the organisation of the military establishment of the Grand Duchy was regulated by the Diet, which has since passed an Act 1877-78, requiring universal military service from every Finlander for the defence of the country.

CRONSTADT.

Continuing our journey along the Finland Gulf, we reach Cronstadt, the chief station of the Russian navy, an island about eight miles in length by about one-and-a-half miles in breadth, situated in the estuary of the Neva, and commanding the passage to St. Petersburg, with a series of towers and castles that are considered impregnable. The garrison numbers 25,000, more than half of the population.

As we approached the island, about nine o'clock in the morning of the 25th, some of the shore batteries were actively engaged with shell practice at floating targets (the line of fire being, as we thought, unpleasantly near), and continuing our course, we pass huge stone fortresses and earthworks, whose guns appeared to point in all directions, and commanding every approach to the estuary.

Numerous iron-clad ships of almost every type were anchored in the roadstead, most of them with steam up, the crews of which, as we threaded our way between them, flying a brand new Union Jack, seemed to gaze upon us with no little curiosity and astonishment.

On reaching our anchorage ground in rear of the war vessels, we

fully realised for the first time during our cruise what it was to be a foreigner. Up to our arrival at Cronstadt we had been exempt from the inconveniences of the passport system, but all foreigners entering or leaving Russia must be provided with passports, showing their identity, etc.

Our passports were all collected at the breakfast table in readiness for inspection, when, soon after anchoring, we were duly boarded by medical, customs, and police officers—four of the latter, under the superintendence of a military officer of rank, proceeding to the saloon, accompanied by our leader, Mr. Perowne, and the captain of the ship, for the purpose of investigating the passport of every passenger on board. This tedious process, lasting about eight hours, was accompanied by a complimentary decanter of sherry and Havana cigars—not forgetting an invitation to lunch, which, of course, was not declined.

Exception was occasionally taken to certain names, for reasons best known to these indefatigable and extremely courteous officials, who appeared either unable or unwilling to realise that a tourist travelling for pleasure should be described as “of no occupation.” My own name being amongst the number, I at once repaired to the saloon, and ultimately satisfied the senior officer, both as to my own former calling and that of my deceased father, which was also required, when the interview courteously terminated.

A lady passenger underwent the same ordeal with the same satisfactory result, after informing the officer, with some warmth, that her father, who had been dead many years, was a magistrate, and of no other “occupation.”

During the morning this same lady was observed, by one of the Russian officials on deck, to be sketching some object on shore. After a while he courteously asked permission to see it, also the folio containing other sketches, to which a reluctant consent was ultimately given, when the said sketch was politely torn up and thrown overboard—a result not altogether to be wondered at, the lady having been previously cautioned by several passengers. The folio and other contents were at once returned.

These tedious proceedings were occasionally diversified by others of a no less rigid but somewhat amusing character. Like many other passenger steamers we had a small brass cannon on deck, occasionally used for signalling purposes. Seeing this, the officials asked for the powder, which was duly handed over, also our signalling rockets, both of which were duly sealed and handed back to us on our return. Finally, about 5 p.m., we are permitted to depart, taking with us a couple of soldiers, who remain upon the ship at our expense until our return to Cronstadt, to see that nothing chargeable for customs’ duty is removed.

Cronstadt is about 20 miles from St. Petersburg, and to enable ocean-going steamers to reach the capital a canal has been constructed (opened in 1885) from the roads at Cronstadt to the mouth of the Neva (about 18 miles), which is one of the most remarkable engineering works in Europe.* After we pass Cronstadt we begin to obtain views of the

* The width of the canal for the first 4 versts from the St. Petersburg end is about 210ft.; for the next 5 versts 280ft., and 125ft. for the remaining length. The uniform centre depth of 22ft. is maintained by constant dredging.

domes and spires of St. Petersburg, which we reach before dusk, and anchor opposite the English quay, remaining here six days.

This magnificent capital, displacing the Moscow of former days, is now one of the finest cities in Europe, containing a population of over a million, being built on reclaimed lands, and chiefly on piles, under the direct superintendence of Peter the Great, who resided, for that purpose, in a small cottage.

The foundations were laid in 1703, the object of the removal of the capital from Moscow being, in the language of the Czar himself, to have "a window looking out into Europe." While Moscow, the former capital, is essentially Oriental, St. Petersburg is a thoroughly European and modern city.

The first private houses were built in 1704, on the north side of the river Neva, in a part of the town now called Old Petersburg.

ST. PETERSBURG.

St. Petersburg stands partly on the mainland, and partly on islands in the delta of the Neva—thus explaining why part of the city is built upon piles. These islands are formed by four main channels, and many smaller ones. The main channels are the Great Nevka and the Little Nevka on the north, the Little Neva and the Great Neva on the south, the latter being the main channel of approach to the city.

On the Basil Island are many handsome and regular streets, and many public buildings, including the Custom House, the Exchange, the University, the Academy of Sciences, the Military School, the Academy of Arts, the School of Marine Cadets, and the School of Mines.

On the mainland, south of the Neva, are the English Quay, the Equestrian Statue of Peter the Great, the Admiralty, the Winter Palace, the Summer Garden and Palace, the Palace of Justice, the School of Engineers, the Cathedral of St. Isaac, and many other important buildings.

As St. Petersburg, like Stockholm, is very much a water city, the bridges are important. The chief are as follows, placing them in the order of approach from Cronstadt, the river being of similar width to the Thames at Westminster.

1. The Nicholas Bridge, from the middle of the English Quay to the Basil Island. It is near here where the St. Sunniva is anchored.

2. The Palace Bridge, from the Winter Palace to the eastern end of the Basil Island.

3. The Trinity Bridge, from the Summer Palace to the Aptekarski Island.

4. The Alexander Bridge, from the south mainland, near the Palace of Justice, to the north mainland. All four of these bridges cross the main channel, or Great Neva.

5. The Tutchkof Bridge, crossing the Little Neva from the Basil Island to the Aptekarski Island.

St. Isaac's Cathedral is first visited. This stupendous building was built 1819-1858, in the shape of a Greek cross, on the site of a wooden church erected by Peter the Great in 1710. It is approached by broad and handsome flights of steps, the three gigantic portals of magnificent

bronze work requiring six men to open and close. The 112 pillars are of polished Finland granite, each a monolith 60ft. high, 7ft. in diameter, and weighing 128 tons, the Corinthian capitals being of bronze, surmounted by an enormous frieze in six blocks. The central cupola is 296 feet high, supported on 24 granite pillars, and covered with gilt copper, above which rises the elegant lantern, surmounted by a golden cross 336 feet from the ground. Four smaller cupolas containing the bells, the largest of which weighs 29 tons, are erected at each corner of the building.

The interior is very gorgeous, but thoroughly substantial, the visitor on entering being at once struck with the malachite and lapis-lazuli pillars, and the royal doors of the screen, or *ikonostas*, also the splendid stained-glass windows, and the walls and floor of polished marble. In addition to numerous ikons of solid gold, studded with precious stones, were valuable pictures and mosaics. We were present at the Sunday morning service, and were much struck by the devotion of the worshippers, several of whom were to be seen kneeling and touching the elaborate polished marble floor with their foreheads. Length of the cathedral, 364ft. by 315ft., and the total cost $3\frac{1}{4}$ millions sterling, including construction and decoration. About £200,000 of this vast amount was spent in obtaining a firm foundation, for which a forest of piles, 21ft. long, was sunk in trenches 16 to 21ft. deep, and further outlays have been, and still are, incurred in propping and preventing from sinking that part of the building which faces the river.

The Equestrian Statue of Peter the Great, opposite the Isaac Cathedral, stands first among the monuments of St. Petersburg. The entire statue was produced at a single casting, but the head of the Emperor, which is considered a striking likeness, was modelled afterwards. His face is turned towards the Neva, while a serpent, emblematical of the difficulties he encountered, is trodden under foot by the spirited charger. The whole is wonderfully balanced on the hinder legs and the tail of the horse, which is joined to the serpent's body, and into which a weight of 10,000lbs. has been thrown. The total weight of the metal (about 16 tons) has been so skilfully distributed by varying the thickness of the bronze from 1in. to $\frac{1}{4}$ of an inch, that the centre of gravity is fixed immediately above the horse's feet, which rest upon the ground.

The huge block of granite that forms the pedestal weighs 1,500 tons, and was brought from Lakhta, a village near St. Petersburg. It was originally 45ft. long, 30ft. high, 25ft. across, and weighed about 1,600 tons, but in cutting it the mass broke into two pieces, which were afterwards joined. It is now only 14ft. high, 20ft. broad, and 43ft. long. The statue is 17 $\frac{1}{2}$ ft. in height and is very imposing. Another equestrian statue of this sovereign stands opposite the Emperor Paul's Palace, near the School of Engineers.

The palaces in St. Petersburg are numerous, viz., the Winter Palace, the Michael Palace, the Marble Palace, the Taurida Palace, and Peter the Great's Cottage—in addition to which are buildings that are classified as palaces, but of minor historical interest.

The most imposing of these is the Winter Palace, an immense four-storey building on the left bank of the Neva, rebuilt in 1839, after being destroyed by fire in 1837, and measuring 455ft. in length, 350ft. in

breadth, and about 80ft. in height. This palace, which is allowed to be one of the finest in Europe, is used only for State ceremonies, for which its numerous gorgeously gilded halls and galleries would appear to be specially intended. The Romanoff Portrait Gallery may be specially mentioned as containing portraits of all the sovereigns of the reigning house and of their consorts. On the third floor is the Treasury, containing the Crown jewels, conspicuous among which is the great Orloff diamond, which surmounts the Imperial sceptre of Russia, and is a worthy ornament for the emblem of a dominion so extensive. Amongst the numerous halls and portrait galleries mention should be made of the White Hall, with handsome marble statues, and a collection of costly gold and silver gilt dinner plates, on which bread and salt had been presented to the Czar. These plates, to the number of about 120, were laid out separately on long tables, the small vessels for salt being attached to the plates. Few visitors are now admitted to this palace, a special permit having previously to be obtained from one of the State departments.

Adjoining the Winter Palace on the east side is a large and interesting building called the Hermitage, founded by Catherine II., and used by the Empress as a refuge from the cares of state, hence the name. Very considerable additions have since been made to the original building, but the same elegance and purity of design have been rigidly adhered to. It forms a parallelogram 512ft. by 375ft. with two large courts, and is approached by a noble peristyle, supported by ten figures of hard grey granite, measuring 22ft. with their pedestals.

The building is now used as a museum, and is allowed to be one of the finest in Europe. It contains a very extensive and costly collection of art and literature, also numerous picture galleries, in which all the European schools are represented, a gallery of ancient sculpture, collections of local antiquities, also of coins and gems, a library and theatre, also a considerable number of copies of frescoes by Raphael from the Vatican galleries.

The Gallery of Peter the Great is extremely interesting. Although it forms part of the Winter Palace it is reached from one of the rooms of the Hermitage. Here may be seen pictures and objects bearing on the life of the great emperor—the turning lathes and carving tools with which he worked, also numerous specimens of his handicraft. His telescope, mathematical instruments, books, and walking sticks, amongst other articles in the collection, form objects of considerable interest and curiosity.

One of the curiosities of St. Petersburg is the Cottage of Peter the Great, previously mentioned. It was the first house built on the Neva, and occupied by him when superintending the founding of the new capital. It is on the south-east of Aptekarski Island, near the Trinity Bridge, and consists of two rooms and a kitchen. Here also is seen a boat built by Peter and other relics.

Between the former Leuchtenburg Palace and St. Isaac's is a fine equestrian statue of Nicholas I. in the uniform of the Horse Guards. The huge pedestal is formed of granite of various colours, and the four corner figures have been cast after portraits of the consort of Nicholas and his three daughters.

There are numerous other monuments, including the Alexander Column, erected in 1832, near the Winter Palace, to the memory of Alexander I., with the inscription:—"To Alexander the First—grateful Russia." Also the monument to Catherine II. in Nevski Prospekt (the chief street in St. Petersburg).

Amongst the many churches in St. Petersburg, I must not forget to mention the Cathedral of St. Peter and St. Paul, built upon a small island near the Trinity Bridge, and within the walls of the Fortress, which surround the island.

This remarkable building, after being struck by lightning and rebuilt three times, was finally completed by the erection of a new spire in 1772. It contains the remains of all the Russian Sovereigns since the foundation of St. Petersburg, excepting Peter II., who died and was buried at Moscow. At the time of our visit, the pillars were still draped in black, festooned with silver, in memory of Alexander III. whose tomb had just been completed. The walls are covered with military trophies, standards, flags, keys of fortresses, shields, battle axes, etc., taken from various countries.

Another famous church is the Cathedral of Kazan, in the Nevski Prospekt, built upon piles, at a cost of £600,000, with a rounded colonnade of 136 columns in imitation of St. Peter's at Rome. The ikonostas and the balustrade in front are of silver, being a "zealous offering of the Don Cossacks" after the campaign of 1812. The silver weighs nearly half-a-ton, two-thirds being church plate seized by the French, but retaken by the Cossacks. The name of the Almighty is rendered in diamonds over the principal door of the screen. The miraculous ikon of the Virgin, a copy of the original at Kazan and removed from Moscow to St. Petersburg by Peter the Great, can be seen in the ikonostas covered with fine gold and studded with precious stones valued at £15,000. On the right hand side of the altar screen is a costly ikon studded with pearls, and beyond it is a full length ikon of our Saviour, of which the gloria is studded with precious stones. On a stand to the left of the screen is another costly ikon, presented by Princess Gagarin, the gloria alone weighing 10lbs. of pure gold. The principal altar is of silver gilt, with jasper pilasters. The lapis-lazuli cross in front, is the gift of Alexander III. On the altar stands a silver casket, adorned with Siberian jasper, representing the Cathedral in miniature, but without the present colonnade. At the back of the altar, male visitors are shown on a lectern, a copy of the Gospels, bound in solid silver. It was presented by Catherine II. Four immense candelabra of silver stand before the principal altar screen. The pulpit, the Imperial seat, or rather stand, and the floor, are of coloured marble, with steps of highly polished jasper.

The keys of many fortresses are suspended against the pillars of this military looking cathedral, including those of Hamburg, Leipsic, Dresden, Rheims, Breda, and Utrecht.

Most of the leading streets and thoroughfares in St. Petersburg are of noble proportions, and many of them well paved, but a considerable portion of the city is still paved with rough, irregular cobbles, which, when driving, is highly inconvenient, and the noise almost unbearable. The city is amply provided with well appointed trams and carriages of

all descriptions, remarkably well horsed, but the favourite conveyance for nearly all classes appears to be the drosky—a small kind of Victoria for two persons, and a seat in front for the driver—drawn by little, wiry-looking, but willing horses, whose pace leaves nothing to be desired, although occasionally in turning the corners of streets the occupants run some risk of being overturned.

Nearly all the horses we saw appeared to be yoked with a peculiar circular article over the collar, called a duga, and all the drivers of droskys and other carriages are neatly attired in a peculiar kind of long woollen garment reaching down to the heels, like a woman's dress, and girdled at the waist, which, with a small, low-crowned hat, much turned up at the sides, and long boots, completes the equipment. Whips are rarely if ever used, the Russian driver being evidently "merciful to his beast"—in fact, the whole turnout compares very favourably with public conveyances in our own country.

A short drive through the streets of St. Petersburg brings the visitor to the Moscow Gate or Triumphal Arch. It is in the Greek style of architecture, was completed in 1838, and consists of twelve columns, 68ft. high, and an inscription—"To the victorious Russian armies, in memory of their deeds in Persia, in Turkey, and in the pacification of Poland, in the years 1826, 1827, 1828, 1829, 1830, 1831."

An agreeable hour is spent in the Museum of Imperial Carriages, containing a wonderful collection of State carriages and equipages of successive sovereigns, many of them magnificently decorated. The collection includes the sledge of Peter the Great, made entirely by his own hands.

In striking contrast to this may be seen in the same room a melancholy relic connected with the decease of Alexander II., viz., the carriage in which he rode when his life was taken. It exhibits the effects of the dynamite shell that was thrown into it. In this collection may also be seen all the State harness and liveries for about 800 men, and the saddles and bridles of His Imperial Majesty. There is a set for each regiment according to the uniform worn by the Emperor at reviews. Each of the various rooms also contains an excellent collection of Gobelin's tapestry. Within the spacious court of this building are the Imperial Stables, which we had not time to visit.

There are several parks, gardens, and squares here for the benefit of the public, all of which are freely visited, a favourite lounge of the inhabitants in spring being the Summer Garden and Palace, on the Court Quay of the Neva. Many of the residents leave the capital for country residences in the summer.

It would be impossible for me to compress within the limits of this paper all the numerous places of attraction in this highly interesting city, very many of which are of necessity left over for what I hope will be a future visit. Most of the people with whom we came in contact—representing various classes—were, with few exceptions, decently dressed in accordance with their respective positions in life, and the working people displayed considerably more intelligence than we were led to expect before our arrival. Doubtless many of them are poor, but their requirements are proportionately small; and with the further spread of education, and a more intimate contact with the outside world, it is to be hoped that these humble citizens may be more active

participants in the benefits of a progressive civilisation, whilst they are at the same time endeavouring to contribute to the development of the resources of their country. On all hands we were treated with the greatest courtesy, and although we found little English spoken, our three days' hard work in St. Petersburg was very enjoyable.

Moscow.

On the evening of the 28th, sixty-two of our party, duly provided with passports, leave St. Petersburg for Moscow—403 miles—in a special train, consisting of three very comfortable and well-appointed sleeping cars. Starting about 10-30 p.m., after the departure of the ordinary night mail, and breakfasting at Tver, about 100 miles from Moscow, we reach the latter place about 11 a.m. the next morning.

Our place of rest for the three days' stay is the Hotel Berlin, about the centre of the city, and immediately upon arrival passports are respectfully demanded by the proprietor for the purpose of being viséd, and duly handed back on our departure, after payment of the usual fees, including the landlord's proportion.

Whatever may have been our first impressions of Russia upon reaching Cronstadt, and ultimately St. Petersburg, we were soon made aware that Moscow, with its vast array of towers and gorgeously gilded domes, had all the appearance, if not the reality, of a purely Oriental city. It was totally unlike anything we had ever seen; and at times, when gazing upon these extraordinary but imposing-looking objects, the observer might be led to wonder if, after all, they were real, or only gaily-coloured stage scenery placed there for removal, to be afterwards replaced by others with which our ordinary daily lives are more familiar. With thoughts like these we drive through the city, on the afternoon of our arrival, to the Sparrow Hills, an elevated suburb a few miles out of Moscow to the south-west, where an excellent view of the city may be had, and where Napoleon obtained his first glance of it.

Moscow, the ancient capital of Russia, and now the second city in the empire, with a population of about 900,000 inhabitants, stands on the river Moskva (from which its name is taken), a tributary of the Volga, in nearly the same latitude as Edinburgh. The city is spread over a circumference of about 30 miles, its greatest length from south-west (the Sparrow Hills) to north-east (the Préobrajenskoe Cemetery) being nine miles, and its maximum breadth, from east to west, about six miles.

The Kremlin is at once the centre and the crown of Moscow. It covers an area which forms an irregular triangle, having its apex in the north, and comprising about 66 acres. It includes a fortress, an arsenal, a palace, a senate house, a treasury, three cathedrals, a monastery, a convent, and several churches.

The walls of the Kremlin extend to nearly a mile and a half; they have 18 towers, and are pierced by five gates—viz. : The Redeemer gate on the east, the Nicholas gate on the north-east, the Trinity gate on the west, the Barovitski gate on the south-west, and the Tainitski or prison (secret) gate on the south.

The Kremlin having become overcrowded, the Regent Helena, mother of Ivan IV., ordered a large space to be enclosed outside the Kremlin, and to be called after her birthplace Kitai Górod in Podolia. This space,

called also the Chinese Town, is walled in, the walls being commenced in 1535; they have been carried close up to the Kremlin at either end, which they join, and are pierced by six gates. Though called the Chinese town, it has no connection whatever with the Chinese Empire, although in the Chinese language, *kitai* means "the centre," and this part, like the Kremlin, occupies about the centre of the city.

Passengers arriving from the Nicholas Railway Station from St. Petersburg will, on their way to the centre of the city, pass under the Red Gate, or Triumphal Arch. It consists of one large and two smaller arches, and is surmounted by a bronze figure of Fame. It was erected in 1742 by the merchants of Moscow on the occasion of the coronation of the Empress Elizabeth, who passed through it on her progress from the Kremlin. The original colour has since been changed to white and red.

Most visitors to Moscow will, no doubt, have observed a number of long buildings, from the centre of which springs a tall spire, with a balcony, and surmounted by a flagstaff. These are fire stations, of which there are close upon twenty, erected in different parts of the city, all in direct telegraphic communication with each other. When an outbreak of fire occurs its locality may be at once known by the hoisting of signals on the flagstaff, each district possessing its own, when mutual help can be given if required.

The Foundling Hospital is one of the largest institutions in Moscow, and admits about 14,000 children annually. They are not left at the door of the building as in some similar institutions, but taken openly by their mothers or some friend, the only questions asked being—"Has the child been baptised?" and if so, "By what name?" They are then registered in the books of the institution, the number assigned to the child is attached round its neck and figures on its cot, and a receipt with corresponding number is handed to the bearer of the child, to enable her to visit it or claim it at any period up to the age of 10 years. The boys, like the rest of the male population, are amenable to military service, but the majority of them become agricultural labourers. Many of them are brought up at the Industrial School at Moscow, where they are taught various trades. The girls are trained as nurses or midwives, for which purpose a special school is attached, but they are all well cared for, and if a girl marries in her village before attaining her majority she is provided by the institution with a wedding outfit. Notwithstanding that every care is taken of these little ones it is computed that only about a quarter of those brought to the hospital arrive at maturity.

The "Redeemer" Gate in the Kremlin was built in 1491. A tower, constructed by Christopher Galloway, who also placed a clock in it, was added in 1626. Over it is a picture of the Redeemer, which is held in high veneration by the orthodox, and all persons on going in or out are expected to uncover, the Emperor himself conforming to the custom.

Having now entered the Kremlin one of the most striking objects before us is the Tower of Ivan the Great, 325ft. in height. The basement is occupied by a chapel, and in the next three storeys are suspended 34 bells, the largest of which, the "Assumption," weighs 64 tons. It was recast after the partial destruction of the tower during the conflagration in 1812. The most ancient of the other bells bears the date of 1550. In the highest tier are two silver bells of exquisite tone.

Napoleon and his Marshals viewed the city from this tower, and General Lauriston established his chancery in it.

The famous great bell of Moscow, or king of the bells, stands at the foot of this tower on a pedestal, placed there in 1836 by order of Nicholas I. It has fallen and been recast several times, and after its last fall in 1737, a large piece weighing 11 tons was detached from it. Its weight is now nearly 200 tons, its maximum thickness 2ft. It measures 26ft. 4in. in height from the top of the bell and cross, and its circumference is 67ft. 11in. The diameter of the bell at its top is 8ft. 9in. outside, and 6ft. 5in. inside. The bell was never known to have been rung.

Between the Trinity and Nicholas Gates, within the Kremlin, stands the Arsenal. The cannon taken from the French are arranged in long rows along the principal front of the building to the number of 365 pieces—in addition to which there are over 500 other cannon captured from various other European countries. The huge cannon near the furthest angle of the Arsenal is called the "Czar Cannon," on account of its extraordinary size. It weighs nearly 40 tons, and was cast during the reign of Theodore I. whose effigy it bears.

One of the most magnificent buildings in the Kremlin is the Great Palace, facing the south gate, and commanding an extensive view across the river. It is a comparatively modern structure, being built in the reign of Nicholas I., and contains about 700 rooms.

In addition to the private apartments, which are very numerous and most elaborately furnished, may be mentioned the Hall of St. George, dedicated to the Military Order of that Saint, and founded by Catherine II. in 1769. This magnificently-decorated apartment measures 200ft. by 68ft. The names of the individuals and of the regiments decorated with the Order since its foundation are all inscribed on the walls in letters of gold. The furniture is black and orange, the colours of the Order. The lustres and candelabra, which are very magnificent, hold 3,200 candles.

The Alexandra Hall is another gorgeous apartment, pink and gold, dedicated to the Order of St. Alexander Nevski, founded in 1725 by Catherine I. Amongst the numerous other very elaborate and imposing State apartments may be mentioned the Hall of the Order of St. Catherine, the Hall of St. Vladimir, with its magnificent flight of steps at the end, which are only used on important state occasions, as when the Emperor goes to the Cathedral of the Assumption for his coronation; and the Gold Court, where the diplomatic corps are entertained after the ceremony.

In addition to these are the Throne Room or Hall of St. Andrew, the senior order of knighthood, established by Peter the Great, 1698, the picture gallery, the chapels, the council chamber, and an extensive suite of private apartments for the Emperor and other members of the Imperial Family.

The church adjoining the palace is the Cathedral of the Assumption, where the Emperors are crowned, which appears almost overshadowed by the lofty and imposing Ivan Tower close by, previously alluded to. This extraordinary ecclesiastical building is one of the most venerable and interesting in Russia. Its fine domes, including a central cupola,

are all covered with plates of copper, richly gilded, which give it a brilliant and imposing appearance.

The massive silver chandelier, under the cupola, with its 46 branches, weighs 900lbs., and a famous picture in the Ikonostas or screen—that of the Holy Virgin of Vladimir—which originally came from Constantinople, but was brought to Moscow from Kieff in 1155, is adorned with jewels valued at £45,000.

Behind the Ikonostas stands a Mount Sinai of pure gold, the gift of Prince Potemkin. It contains the Host, and the weight of the gold alone is 19 lbs., apart from the silver, which is at least of equal weight.

A Bible, presented by the mother of Peter the Great, is so large that it is said to weigh about 100 lbs., and is studded with emeralds and precious stones. The weight of the gold in the Ikonostas and the church vessels, etc., is estimated at about 106 cwt. For further information as to the marvellous wealth of this Cathedral I would refer you to the late Dean Stanley's work on the Eastern Church may be seen.

From the courtyard of the palace may be seen the steps leading from the palace to the Cathedral of the Assumption, along which the Emperors pass to be crowned. It may be mentioned that this individual act of the gorgeous coronation ceremony is performed by the Emperor himself, who places the crown upon his own head. This important function, which in Russia is looked upon as quite a historical event, is generally expected to take place in May next, when the present Czar, if spared, will assume full regal power as Emperor of all the Russias.

I must not omit to mention the Treasury in the Kremlin. Erected in 1851, it forms the right wing to the Palace, but on the occasion of our visit it was unfortunately closed for cleaning purposes. It is a large building, and contains an extensive collection of armoury, firearms, standards, coronation robes of different Czars, and the regalia—in fact, very similar to that contained in the Tower of London. The throne of Poland, the crown of Peter I., the crowns of Kazan, Astrakan, Georgia, and Poland are also here. There is also a vast collection of the richest and most curious articles of plate, representative not only of Russian art, but of that of almost every other European country.

Amongst the many other religious edifices in the Kremlin are the Cathedral of the Archangel Michael, containing the tomb of Ivan the Terrible, and of other Romanoff princes who preceded Peter I.; also the Cathedral of the Annunciation.

The remarkable cathedral of St. Basil stands at the south end of a vast open space called the Great Red Square, 945ft. by 524ft., situated between the Kremlin and the Kitai Gorod. It was erected on the site of an ancient church, in which the sainted Basil—a popular prophet and worker of miracles, “idiotic for Christ's sake”—was buried in the year 1552. Its architect was an Italian, whose eyes, tradition wrongly reports, were put out by Ivan IV., in order that he should not build another edifice like it. This is one of the most extraordinary looking churches in Moscow. It has 11 domes, each different in colour and design, surmounting as many chapels, connected by a maze of narrow passages, there being little or no space for worship in any of them. Amongst numerous others the shrine of St. Basil may be seen in the church,

which is alone open daily, but to see the upper chapels application has to be made to the clergy, which we had not time to do.

The little Iberian Chapel, at the Resurrection Gate, the principal entrance into the Kitai Gōrod, which is illuminated by 13 silver lamps with wax candles, is always beset by worshippers throughout the day, and their donations amount to a very large sum, part of which goes to the stipend of the Metropolitan of Moscow. On visiting Moscow, the Emperor always dismounts and prays at this chapel before entering the Kremlin.

The Temple of the Saviour is a magnificent modern church built to commemorate the deliverance of Moscow from the French in 1812. It was commenced in 1839 at the south-west angle, but outside the Kremlin walls, and was completed in 1883 entirely with Russian materials and labour. The building is, as usual, in the shape of a Greek cross. Each of the four belfries at the angles is surmounted by a golden cupola, and over the whole rises a central gilt dome 98ft. in diameter, upon which is fixed a cross at an elevation of 350ft. from the ground. The external walls are of white stone quarried in the neighbourhood of Moscow. The building covers an area of 3,500 square yards, and will hold about 7,000 persons. It is lighted by 42 windows, and at night by candles running round the cornice of the walls. It is very richly decorated with gold, and with a species of syenite quarried in the Kolonina district of Moscow, and admitting of a high polish. There are many valuable pictures distributed throughout the church, and the total cost of the entire building was about two millions sterling.

The small and unpretending church at Saritzin, near Moscow, is the oldest church in Russia. It is very interesting as showing the extraordinary change that has taken place in ecclesiastical architecture—whether measured by the St. Petersburg or the Moscow standard.

Mention has been made of the Bazaar, situated on the east side of the Great Red Square, facing the Kremlin, and completed in 1891. It is a colossal three-storeyed building, with shops and passages forming a perfect labyrinth. The trade of Moscow has been centred in the Kitai Gōrod since 1596, and here may be purchased goods of almost every variety, including Russian handiwork in gold, silver, and enamel.

One of the most remarkable secular buildings in Moscow is the Great Riding School opposite the Kremlin Arsenal, but outside the walls, erected in 1817; this is one of the largest rooms in the world unsupported by pillar or prop of any kind, being about 560ft. in length, 148ft. in breadth, and 41ft. in height.* The troops are exercised here in winter, and the building is also used for exhibitions, monster concerts, etc. The ceiling is flat, and the exterior of the roof very slightly elevated.

The Romanoff House is visited by most people who go to Moscow, which gives them an opportunity of studying the architecture and mode of life of the Russians in the Middle Ages. It was the birthplace of Michael, the first sovereign of the reigning dynasty, whose father was also brought up in it. The house is not large, having a frontage of about 57ft. facing the open street. It has four storeys, and the principal

* The great Town Hall of Padua is only 240ft. long and 80ft. broad; Westminster Hall, 275ft. by 75ft.; and King's College, Cambridge, 291ft. by 45½ft. St. Pancras Station, London, is, however, 700ft. by 240ft.

entrance is from the court on the south. The rooms are small and extremely low. The interior, after having been ravaged by fire and sacked by the French, is now entirely rebuilt, and used more as a museum of ancient domestic art than a monument of antiquity.

We much regretted our brief stay of three days prevented us seeing more of the many interesting institutions of Moscow, such as the Imperial University, the various Museums, Picture Galleries, Libraries, Zoological Gardens, Hospitals, and Public Parks, the latter seeming to abound on all sides of the city.

Moscow is clean, and well lighted ; its streets are good but not wide and in many instances of different levels, but in all cases within the inner circle of the city, are bad, consisting of large and irregularly shaped cobbles, and whether walking or driving are extremely inconvenient. The footpaths also are generally narrow, and raised a considerable height from the roadways, which, although very objectionable, and at times dangerous to foot passengers at night, is considered necessary for clearing away the snow in winter. In the outer circle of the city, the roadways are wider and well kept, and in nearly all cases nicely planted with trees on one and sometimes both sides, when the effect is very pretty.

Being now the centre of the railway system of the Empire, Moscow is growing in importance as a seat of trade and industry. It possesses numerous manufactories or works, which give employment to many thousands of artisans, in cotton spinning and weaving, in cloth and worsted mills, silk mills, dye works, tanneries, etc. The railways are fast developing a large direct trade between Moscow and the Baltic ports, both German and Russian, as well as with Odessa, now in direct water communication with China and India, by means of the Suez Canal. The markets now opened in Bokhara and Turkestan, accessible *via* the Volga and the Caspian, add considerably to the development of Moscow as a commercial centre.

The River Moskva is of little or no use for purposes of navigation, being too shallow, but it is used to some extent by small passenger steamers when a sufficient depth of water permits.

As a proof of the marked courtesy we received during our stay in Russia, upon our return from Moscow we were courteously invited by the Metropolitan to a special service in the Cathedral, which we were unfortunately unable to attend in consequence of the departure of the steamer before the hour fixed.

Prince Andronikoff lunched on board the steamer, and in an enthusiastic speech in French proposed the health of Her Majesty the Queen of England, to which our leader, Mr. Perowne, had the honour of responding by proposing the health of the Czar of all the Russias, which was also enthusiastically received. The Prince assured Mr. Perowne that if it had been known earlier that we were coming he would have planned some most interesting receptions, and promised an enjoyable time in the event of a future visit.

We left St. Petersburg on the 1st June, and after calling at Cronstadt to examine passports, which took about four hours, and exchanging the two soldiers for our powder and rockets, we took our departure for Gothenburg, where we spent one day, reaching Leith on the morning of the 6th, after an extremely interesting and enjoyable cruise.

THE WHITWORTH INSTITUTE.

[Addressed to the Members of the Society, at the Museum in Whitworth Park, by
The SECRETARY, Saturday, November 7th, 1896, at 3 p.m.]

It would have given me great pleasure if some one better qualified than I am had given you the address to-day.

Amongst the benefactors to my native city, and not one of the least of them, stands out the name of Joseph Whitworth, a man who from small beginnings in Pump Street attained to the headship of a great engineering and gun-making business, and who obtained great wealth. The point of interest in his history is the quality of mind which would not be satisfied with less than perfection. The machines with which to make exact machines, with interchangeable parts, was the great accomplishment of this scientific mind.

The foundation of the Whitworth Scholarships for the purpose of giving exact knowledge to those who are fitted to receive it was a noble idea and has been productive of much good. The application of the large amount of money left by him for public purposes was no doubt intended to carry forward in the region of science and art the same fine quality of exact training. One of those to whom the administration of this fund has been committed is Mr. R. D. Darbyshire, and I think a large amount of the work in connection with it has been done by him. This beautiful park and the retention of this fine example of an old Manchester merchant's house, and the erection of the beautiful galleries we shall see presently, are doubtless due to his influence.

The statue, made by the celebrated artist Tinworth, which adds to the ornamentation of the park, was designed by Mr. Darbyshire, and shows his love of children; and the lake, with its little strand from which the youngsters can sail their boats, is also a manifestation of this loving disposition. I am very sorry that we have not the presence here to-day of this gentleman, and I will read a note I have received from him.

1, St. James Square, Manchester,
4th November, 1896.

E. Sowerbutts, Esq.

Dear Sir,—I am extremely sorry that a sudden call to London (on account of an old friend and client) will prevent my meeting you and your friends on Saturday at the Institute. I hope you will have pleasure in seeing what we have to show.—Yours truly,

R. D. DARBYSHIRE.

The work of the Whitworth Institute may be said, as far as the Trustees are concerned, to be now completed in several departments. The Technical work has, with the necessary funds, been handed over to the Technical Committee of the Corporation, and the Art Classes have with further gifts been dealt with similarly. I understand the Technical work at the residence of the late J. Whitworth, at Darley Dale, is still carried on, with what success I do not know. The charter and the rules of the Institute are in my hands, and it appears from them that now the work will be concentrated here (at Whitworth Park). There is one point which I think is not very well known, and that is, that any person can become a subscriber to the Whitworth Institute. Here, at all

events, have been collected a very fine set of water-colour drawings, from the earliest to the present. These represent the work and progress of water-colour drawing in England. There were no doubt very much earlier than any of these examples workers in water-colours abroad, but the water-colourists of England form a distinct school, and one from which drawings of very great beauty have emanated; and in these two galleries (which are probably part of a set) the light is very beautifully diffused, and the delicate colours of the pictures can be seen to very great advantage, there is lodged for inspection and study an exceedingly fine and complete set of examples. Get the catalogue for 1894. It is not merely a catalogue, but a short history of this School of Art, and in the newer catalogue you will find a collection of oil paintings, engravings, antique, mediæval and renaissance textiles, and of sculpture and statuary. I understand that some arrangements are in progress by which the water-colours in the City Art Gallery may be brought here; it may be a grand thing, but I should not like to see the walls here covered with water-colours only. Many children in this district will obtain their first and most lasting impressions in Art from what is exhibited here, and I should be sorry if there were no oil paintings left for them to see.

With these few remarks we will now accompany the Curator through the rooms of the old house and the beautiful galleries (erected from the designs of Mr. J. W. Beaumont, F.R.I., B.A., of St. James' Square), who will give us more detailed information, and after that the Owens College Meteorological Installation in the Park may be examined.

NEW ATLAS.

PHILIPS' NEW HANDY GENERAL ATLAS OF THE WORLD. A Series of 60 Plates, containing over 120 Maps and Plans, illustrating Physical, Political, and Commercial Geography. Edited by GEORGE PHILIP, Junr., F.R.G.S. With a complete index of over 100,000 names. London: George Philip and Son. 1897.

THIS is a new edition of the well-known Handy Atlas of Messrs. Philip.

It is a valuable addition to the roll of our English atlases. Some of the maps are quite new, and they all appear to have been drawn and printed at Liverpool.

The boundaries of the different States are quite up to date, and the number of places mentioned on the maps and in the index makes the atlas an admirable book of reference.

It is, however, a pity that the index references are to these maps only. The usefulness of the index would have been much increased if the references had been made to latitude and longitude. This remark applies to a good many modern atlases.

Owing to the large number of names on the maps the physical features of the countries are somewhat obscured, and larger maps of the Arctic and Antarctic would have been advantageous.

The atlas is, however, a distinct advance in cartography, and we welcome it as an evidence of the great care now exercised not only in the actual workmanship but in the promise of the application of research and scholarship to our English work.

The maps are generally clear, and the colours employed fairly distinct. The maps, for instance, of India are very well drawn, and the inset of the N.W. Frontier is just now very useful.

We are glad that so satisfactory a work has been produced at home, and cordially recommend the atlas to those who may be looking for a family atlas or for a handy book for office use.

CORRESPONDENCE.

THE FEDERATED INSTITUTION OF MINING ENGINEERS.

Neville Hall, Newcastle-upon-Tyne, October 21st, 1896.

Sir,—The "Catalogue of Scientific Papers" compiled and published by the Royal Society of London was intended to serve as an index to the titles and dates of scientific papers contained in the transactions of societies, journals, and other periodical works. This catalogue is highly valuable to all technical inquirers, and it is a matter of deep regret that the International Conference held under the auspices of the Royal Society of London has decided that the "International Catalogue of Scientific Literature," which is to begin with 1900, is to relate to pure science only, applied science being strictly excluded. It is possibly too late to remedy the position, which is probably due to the absence of representatives of technical societies at the International Conference.

It would seem desirable, further, that there should be a conference of technical societies to discuss the publication of a subject-matter index to technical and scientific periodicals. This Institution has had for some time before it the question of the publication of such an index of subjects of interest to mining and metallurgical engineers; and probably a comprehensive index to engineering and other technical papers would prove more valuable.

This suggested Conference of Technical Societies might also consider other questions which interest technical societies individually, but which they are unable to obtain owing to want of concerted action. Thus, such an association might approach the Government on such questions as the excessive cost of postage of transactions, as there can be no valid reason why they should not be placed in the same position—although their transactions are issued at varying intervals of time—by a short Act of Parliament as an ordinary weekly newspaper.

And there are many other matters which, no doubt, crop up in connection with the carrying out of the objects of individual societies in which concerted action would produce valuable results. I am, sir, your obedient servant,

M. WALTON BROWN, Secretary.

The Secretary, Manchester Geographical Society.

ROYAL SOCIETY OF CANADA.

Ottawa, October 16th, 1896.

Sir, I have the honour, on behalf of the Royal Society of Canada, to submit the accompanying memorandum (with appendices) relating to the Unification of Time at Sea.

These documents refer to a scientific reform which has long been under consideration, in the general interests and in the special interest of the mercantile marine of the world.

Paragraph No. 8 of the Memorandum, together with Appendices V., VI., and VII. (pages 29 to 40), refers to the opinions of shipmasters on this question. It will be noted that 97 per cent of representative master mariners are in favour of the reform.

Paragraph No. 5 points out that immediate official action is necessary in order that the reform may not be indefinitely postponed.

In the interests of navigation and commerce the Royal Society of Canada respectfully asks the Geographical Society to assist in promoting the reform by petitioning or otherwise influencing Her Majesty's Government to sanction the unification of time at sea, and to cause the nautical almanac to be adapted to the change.—I have the honour to be, sir, your obedient servant,

JNO. GEO. BOWINEK,

Hon. Secretary Royal Society of Canada.

To the Secretary of the Geographical Society.

INTERNATIONAL GEOGRAPHICAL CONGRESS, LONDON, 1895.

1, Savile Row, London, W., October, 1896.

Sir,—We beg to draw your attention to the following resolutions adopted at the final meeting of the International Geographical Congress, London, 1895:—

That the officers of each Congress continue to act until the organisation of the following Congress, in order—

- (1) To carry out as far as possible the resolutions of the last Congress;
- (2) To keep up relations with the special committees which may be appointed;
- (3) To communicate with the organising Committee of the following Congress regarding all questions pending;
- (4) To present to the following Congress a report on the work done in the interval.

That the Committee of each International Geographical Congress be charged—

- (1) To print and circulate to all Geographical Societies a list of the votes and resolutions carried at the preceding Congress;
- (2) To request each Geographical Society to send in a short report on the progress made in their country on the subjects referred to;
- (3) To appoint a reporter to the next Congress, who shall submit a general summary of progress made in the subjects considered;

In accordance with these resolutions we are desired by the Bureau of the Congress to send you copies of such of the resolutions adopted by the Congress as require the co-operation of the various Geographical Societies of the world. It is only by such co-operation that these resolutions can be carried into effect. The Bureau trusts, therefore, that your Society will take such action as may be considered most effective with a view to accomplishing the objects which the Congress had in view in adopting the resolutions sent herewith.

As it will be necessary for the Bureau to present a Report to the next meeting of the Congress at Berlin in 1899, we should esteem it a favour if you would inform us not later than June, 1898, what have been the results of any action which your Society may have taken in conformity with the terms of the various resolutions.—We have the honour to be, your obedient servants,

J. SCOTT KELTIE,
HUGH ROBERT MILL, } Secretaries.

To the Secretary, Manchester Geographical Society.

INTERNATIONAL GEOGRAPHICAL CONGRESS, LONDON, 1895.

RESOLUTIONS.

ANTARCTIC EXPLORATION.

That the Congress record its opinion that the exploration of the Antarctic Regions is the greatest piece of geographical exploration still to be undertaken. That, in view of the additions to knowledge in almost every branch of science which would result from such a scientific exploration, the Congress recommends that the scientific societies throughout the world should urge in whatever way seems to them most effective, that this work should be undertaken before the close of the century.

GEOGRAPHICAL BIBLIOGRAPHY.

That the Permanent Bureau of the Congress should follow out the study of Geographical Bibliography; and that it be authorised to associate with itself competent persons, and to give them the necessary power for prosecuting the inquiry.

[The Permanent Bureau, on its part, will do its best to carry out this Resolution. At the same time it would request the various societies to prepare suggestions on the subject, to be submitted to the next meeting of the Congress.]

TOPOGRAPHICAL SURVEY OF AFRICA.

That it is desirable to bring to the notice of the Geographical Societies interested in Africa the advantages to be gained—

- (1) By the execution of accurate topographical surveys, based on a sufficient triangulation, of the districts in Africa suitable for colonisation by Europeans.
- (2) By encouraging travellers to sketch areas rather than mere routes.
- (3) By the formation and publication of a list of all the places in unsurveyed Africa, which have been accurately determined by astronomical observations, with explanations of the methods employed.
- (4) By the accurate determination of the position of many of the most important places in unsurveyed Africa, for which operation the lines of telegraph already erected, or in course of erection, afford so great facilities.

MAP OF THE WORLD; SCALE 1: 1,000,000.

That the following resolutions drawn up by the Commission appointed at the Fifth Congress relative to the preparation of a map of the World, on the scale of 1: 1,000,000, be adopted by the Congress:—

- (1) The Commission has received the Report of the Berne Committee, and feels grateful for the work done by it.
- (2) The Commission declares the production of a map of the world to be exceedingly desirable.
- (3) A scale of 1: 1,000,000 is recommended as being more especially suited for that purpose.
- (4) The Commission recommends that each sheet of the map be bounded by arcs of parallels and of meridians. A poly-conical projection is the only one which is deserving of consideration. Each sheet of the map should embrace 4deg. of latitude and 6deg. of longitude up to 60deg. north, and 12deg. of longitude beyond that parallel.
- (5) The Commission recommends unanimously that the meridian of Greenwich and the metre be accepted for this map.
- (6) The Commission recommends governments, institutions, and societies, who may publish maps, to accept the scale recommended.
- (7) The Commission lays down its mandate, and recommends that the Permanent Bureau of the Congress be charged with the duty of carrying on its work, and be authorised to co-opt for this purpose scientific men representing various countries.

HYDROGRAPHIC RESEARCH IN THE BALTIC, NORTH SEA, AND NORTH ATLANTIC.

That the Congress recognises the scientific and economic importance of the results of recent physical and chemical research in the Baltic, the North Sea, and the North Atlantic, especially with regard to fishing interests, and records its opinion that the survey of these areas should be continued and extended by the co-operation of the different nationalities concerned, on the lines of the scheme presented to the Congress by Professor Pettersson.

SEISMIC OBSERVATIONS.

That the Congress acknowledges the utility, and, indeed, the scientific necessity, of an international system of stations for the observation of earthquakes.

GEOGRAPHICAL ORTHOGRAPHY.

That the various Geographical Societies be requested to study the question of arriving at some agreement as to the writing of foreign names, and to prepare reports for the next Congress.

GEOGRAPHICAL BIBLIOGRAPHY.

That this Congress expresses its approval of the principle of State-printed Registration of Literature as the true foundation of National and International Bibliography, and approves the appointment of an Inter-

national Committee to further the said object, the constitution of the Committee to rest with the Bureau of the International Geographical Congress.

DATING OF MAPS.

That the Congress put on record its opinion that all geographical maps should bear the date of their completion, in order to obviate the errors which would otherwise be apt to arise.

DECIMAL DIVISION OF ANGLES AND TIME.

That the Congress request the Geographical Societies represented at it to consider the question of the application of the decimal system to angular and time measurements, and to report on the subject to the next Congress.

GENERAL PROGRAMME FOR THE NATIONAL CELEBRATION IN 1897 OF THE FOURTH CENTENARY OF THE DEPARTURE OF VASCO DA GAMA FOR THE DISCOVERY OF INDIA.

DRAWN UP IN PURSUANCE OF THE DECREE OF THE 5TH OF MAY, 1894, AND
APPROVED BY GOVERNMENT.

1. The necessary authorisations and agreements having been previously given there shall be celebrated in the year 1897, throughout the whole of the Portuguese territory, a national jubilee, commemorating the expedition, which discovered the maritime road to India, and consecrated to the Memory of the Portuguese navigators, who first discovered the lands and seas of Africa, Asia, America, and Oceania.

2. Especially destined to commemorate, universally and perpetually this celebration, there shall be created:—

(a) A monetary series, in silver coins of 1,000 reis, 500 reis, and 200 reis of lawful ring, diameter and circulation, within the limits and proportions, that may be competently established.

(b) A series of postage stamps, with the types, limits and proportions, that may be competently established.

§ 1. The Central Executive Committee for the celebration can grant and authorise, by or without competition, on the conditions that it may think convenient, the making and selling on private account, of a medal in gold, silver, and any other metal, and of a medallion in bronze or iron, for the same commemorating purpose and character.

§ 2. An edifice in a convenient locality to be built or temporarily adapted, when it cannot at once be done so definitely, shall be specially destined for solemn, national, and international receptions and meetings, connected with the celebration, and for the installation and exhibition of the Colonial and Ethnographic Museum, in the terms of the decrees of the 12th of August, 1880, and the 10th of March, 1892.

3. In the same year, 1897, the following exhibitions shall be held in Lisbon within the terms of the respective plans, as much as possible

alongside the Tagus, between *Praca de D. Luiz*, and the *Jeronymos*, including the edifice of the *Cordoaria* (Rope-yard):

(a) A National Agricultural and Cattle Show, with live samples of the rural ethnography, to include competition of floricultural, agricultural, and lacteal products;

(b) A National Industrial Exhibition;

(c) A National Ethnographical Exhibition;

(d) A National Exhibition for Fisheries, including the hydrography and orography of the Portuguese waters, their inhabitants and flora, fishing material, and industries derived therefrom and aquariums;

(e) A National Exhibition of Chase, including the qualities and flora relating thereto, chase material and industries derived therefrom;

(f) A National Exhibition of Fine Arts, including works of the 15th and 16th centuries;

(g) A Colonial Exhibition Vasco da Gama.

4. Exhibitions on a smaller scale shall be organised in the National Public Library and Archives, in the Army Arsenal, at the Geological Committee, in the National Museum, in the Fine Arts Museum, and in other public institutions.

5. The Governments of the maritime nations shall be invited to send their naval forces to represent them at the centenary celebration in a great gathering of war vessels, which ought to be held in the Tagus in the month of July, 1897.

6. The large transoceanic Navigation Companies, the Chambers of Commerce and Commercial Associations of the principal maritime cities shall be asked to send representatives to the Centenary celebration.

7. On the same occasion, there shall be promoted the realisation in Lisbon of:—

(a) An International Regatta from the Tagus (Belem Tower) to Sines (the birthplace of Vasco da Gama), and one or more Regattas for coasters and river boats;

(b) An International Rifle Competition;

(c) An International Competition for Bicycling.

8. Means shall be taken for holding in Lisbon in the same year divers Scientific Congresses and Conferences, both international and national, after previous agreement with the public authorities.

Sole proviso.—Likewise there shall be held a conference on public charity and beneficence, to which shall be invited all the charitable and such like institutions of the kingdom.

9. The Central Executive Committee shall promote the drawing up of memoirs, monographs, and other literary and scientific works for the purpose of making better and more known:—

(a) The *Lusiadas*;

(b) The Monument of *Jeronymos*;

(c) The *Custodia* of Belem;

(d) History, Arts, Industries, and Ethnography of the nation:

(e) The Progress of Science and the History and State of Public Education;

(f) Portuguese Navigations, Explorations, and Conquests;

(g) The Lives and Deeds of the different Navigators;

(h) Formation, development, and individuality, both historical and political of the Portuguese nation;

(i) The Portuguese scientific and industrial discoveries and inventions;

(j) The History of Portuguese Naval Art and the study of the most important problems and questions of nautical sciences.

§ 1. The Committee shall establish the mode of appreciation of the memoirs or works presented to it and the assistance, compensations or premiums to be granted, it being understood that it will keep possession of the editions made in the printing offices and on account of the Government either for the latter or in order that the respective proceeds revert in benefit of the funds for the celebration, without prejudice of the said assistance, compensations or premiums.

§ 2. A great planisphere shall likewise be executed, showing the discoveries and principal journeys by land and sea, made by the Portuguese, and this shall be conveniently abridged for distributing among all the official schools and furnishing to private persons, who may apply for it.

§ 3. By agreement with the Government Printing Office of Lisbon a monumental edition of the *Lusiadas* shall be initiated, the whole of the material for which and for the work relating to the same shall be exclusively national.

10. The same Committee shall promote among national artists, to be chosen by them, the composition and execution:—

(a) Of a National Triumphal Hymn and March;

(b) Of a Historic Drama, the subject of which is to be Portuguese;

(c) Of a Portuguese Opera or Lyric Drama;

(d) Of Divers Pictorial and Sculptural Compositions, which are to contribute to the celebration or to affirm in the same the national art;

(e) Of Concerts and Musical Contests.

Sole proviso.—The Committee shall also promote the organisation of concerts for ancient Portuguese music, and the representation of some of the ancient national compositions for the theatre.

11. In order that the National Celebration may as far as possible be extended over all Portuguese territory, and may associate and embrace all classes of society, the Central Executive Committee can constitute in the kingdom, adjacent islands, and in the colonies, and amongst all the Portuguese who reside in foreign countries, special Committees for the purpose of assisting that Committee and promoting and organising the celebration in their respective areas.

12. All Co-operations or Associations of whatever nature, legally constituted, can likewise co-operate or organise special celebrations in harmony with this general programme.

13. Any Committees or Associations that may resolve to co-operate and take part in the national celebration shall communicate to the Central Executive Committee as early as possible their programmes and resolutions, in order to avoid confusion or contradictions in the works which may affect the harmony and signification of the grand national solemnity.

Sole proviso.—Any programmes or resolutions that have not been communicated to the Central Committee and agreed to by it will not be taken into consideration for the effect of the mission with which it is intrusted, and will not be allowed when they go against or disturb the execution of the general plan and of the instructions that regard it.

14. The 8th, 9th, and 10th of July, 1897, shall be for all effects considered as holidays and national feast days in all of the Portuguese territory, in the Embassies, Consulates, and amongst Portuguese resident in foreign countries, and on board of all Portuguese vessels that at the time may be outside the waters of Portuguese territory.

15. At the dawn of day of the 8th of July, 1897, all Portuguese fortresses and vessels of war shall hoist the Portuguese flag and salute the same with one hundred guns; the bells of all the churches shall be rung, and in front of the Town Halls of all the districts, on which likewise the national flag shall be hoisted, large numbers of rockets shall be fired off; regimental bands or any other bands of music shall march through the towns and villages and play the Centenary Triumphal Hymn.

16. On the same occasion the places of public worship shall be thrown open, and thanks given to the Almighty for the Glory and Independence of the nation, and also prayers will be offered up for the souls of all those who have served and honoured their country.

17. Likewise all the public buildings and establishments, depending on the State, the Town Councils and Parishes, shall hoist the national flag, and shall decorate and illuminate the respective fronts on the 8th, 9th, and 10th of July.

18. All citizens shall be invited to decorate and illuminate the fronts of their houses on the same days, and to promote demonstrations of public rejoicings, appropriated to the object of the centenary.

19. In all the Parish Churches a thanksgiving Mass shall be read or sung.

20. The authorities, administrative Co-operations and local Committees shall promote all kinds of festive demonstrations in their respective localities, and more especially general and popular ones, such as illuminations, fairs, processions, dances, popular games, and songs on the 8th, 9th, and 10th of July.

21. All the Town Councils shall be invited to take their competent places in all the solemn acts of the celebration, with their respective insignia and standards.

22. For the like purpose invitations shall be issued to:

- (a) All Agricultural, Commercial, and Industrial Societies;
- (b) All Class, Aid, Mutual and Benevolent Associations, and Sporting Clubs;
- (c) All Schools and Learned Societies and the Press.

23. At the hours and in the terms of the respective special programmes, the following demonstrations of festivity and of great public joy shall be realised in Lisbon:

(a) On the 8th:

I. A *Te Deum*, composed by a Portuguese author to be sung in the church of St. Maria de Belem.

II. A civic procession to the church of St. Maria de Belem (the first monument raised for commemorating the discovery of India), and to the tombs of Vasco da Gama and Camoens in the same church;

(b) On the 9th:

A naval procession on the river to visit Alhandra and the *Quinta do Paraizo* (where Affonso de Albuquerque was born), and the inauguration of a Commemoration Monument.

(c) On the 10th:

I. Review of the land and naval forces and of the military schools;

II. At night a grand march *aux flambeaux* from Belem to the Town Hall of Lisbon.

24. To meet the general expenses of the celebration, in charge of the Central Committee, a special fund shall be created with the denomination of "The Centenary Fund," and an agreement shall be made with a Bank, to be chosen by the Government, for depositing the same in account current.

25. The Executive Committee is authorised to resolve in all cases of omission or in unforeseen events.

26. In harmony with the Decree of the 15th of May, 1894, all public authorities and departments shall afford all the assistance and co-operation they can to the Executive Committee of the Grand Committee appointed by this Decree, which for all effects and to the end shall be the Central Executive Committee for the celebration.

Committee Rooms, the 10th of June, 1896.—For the Central Executive Committee: Francisco Joaquin Ferreira do Amaral, president; Luciano Cordeiro, Ernesto de Vasconcellos, secretaries.

This Celebration is postponed to May, 1898.

AGRICULTURE IN THE UNITED STATES.

YEAR-BOOK OF THE UNITED STATES DEPARTMENT OF AGRICULTURE, 1896. 686pp., with 164 illustrations, contents, and index. Washington: Government Printing Office. 1897.

THIS issue by the Agricultural Department of the United States is a remarkable book, and would be of very great value to the English as it must be to the American farmer, for whose use it is, of course, prepared.

Amongst the subjects treated are: The Use of Steam Apparatus for Spraying; Potash and its Function in Agriculture; Some Common Poisonous Plants; Seed Production and Seed Saving; Insect Control in California; Modern Disinfectants; Migration of Weeds; Improvement of our Native (U.S.) Fruits; Tree Planting in Waste Places on the Farm; The Asparagus and Ambrosia Beetles; The Uses of Woods; Standard Varieties of Chickens; The Culture of Olives, Oranges, and Grapes; Agricultural Education and Research in Bulgaria; The Care of Dairy Utensils; and an appendix referring to a large number of important matters.

The book is largely illustrated, and will well repay examination and study by our agriculturists. They, at least, will learn that science is being invoked in America to help the farmer, and may conclude that less rule of thumb and a little more science will equally be of advantage to the English farmer.

THE ANNUAL MEETING OF THE SOCIETY, AND THE ADJOURNED ANNUAL MEETING.

Annual Meeting of the Society, held on Saturday, the 12th December, 1896, at 3 o'clock p.m. The Rev. S. A. STEINTHAL, F.R.G.S., in the chair.

The motion convening the meeting having been read, the minutes of the last Annual Meeting were read and approved.

The Secretary's report and the report of the "Victorians" were read and approved.

THE REPORT OF THE SOCIETY FOR 1895.

The SECRETARY has the honour to report to the Council and to the Society that the work of the Society has been actively carried on, and with fairly successful results during the year.

MEETINGS.

Forty-five meetings of the Society have been held at the Society's rooms and elsewhere. Papers have been read of great value and interest, and addresses have been given on various subjects, and some on topographical and archeological subjects.

ADDRESSES.

The following list of the principal addresses delivered will give some idea of the work of the Society for the year in this direction. But in addition to these addresses, smaller communications on subjects of present-day interest, communications from other societies, letters from the correspondents of the Society, with other matters of great value have been placed before the Society at its various meetings.

EUROPE.

A Journey in Southern Sweden. Mr. G. W. Mellor, J.P., F.R.G.S.

The Recent Discoveries of Remains of Lake Dwellings at Glastonbury.

Professor W. Boyd Dawkins, F.R.S.

A Journey to Italy. Mr. J. J. Gleave.

The Topography of the Kinderscout Region. Mr. H. T. Crook, C.E.

Through Wild Connemara with a Lantern. Mr. M. W. Thompson.

Views in Russia (Moscow and St. Petersburg, etc.). Mr. J. P. Glossop and Mr. Lowther.

The Giant's Causeway and the Way thither. Mr. J. Costley.

Edinburgh: A study of Geographical Cause and Effect. Mr. A. J. Herbertson, Lecturer on Geography at Owens College.

326 *The Journal of the Manchester Geographical Society.*

The Physical Geography of the Castleton District. Professor W. Boyd Dawkins, F.R.S.

The Physical Geography of Saddleworth and the Geological Evolution of the Saddleworth Valleys. Mr. Morgan Brierley.

The Manchester Ship Canal from 1712 to 1895. Mr. W. B. Tracy.

The Underground World of Europe—a review of Mr. Martel's recent explorations. Mr. M. Stirrup, F.G.S.

Notes of a Journey through Italy. Mr. C. H. Bellamy, F.R.G.S.

Our British Scenery: Its Characteristics and Origin. Mr. Osmond W. Jeffs.

Notes of a Short Visit to the Aegean. The Rev. Canon Symonds, M.A.

A Baltic Voyage. Mr. C. J. Blake, F.R.G.S.

Icelandic Exploration. Mr. F. W. W. Howell, F.R.G.S.

Rothenburg. Mr. E. Steinthal.

Notes of a Visit to Oxford. Mr. J. F. Tristram, M.A.

The Kara Sea and Siberia. Captain Wiggins. (Communicated from Tyneside Geographical Society).

The Rectory Garden and the Nico Ditch at Birch. The Ven. Archdeacon Anson.

Birch Church and its Memorials of the Past. The Ven. Archdeacon Anson.
The Liverpool Free Library and its great Collections of Local Interest. Mr. P. Cowell.

The Manchester Gas Works. Councillor Sherratt, J.P.

Edale, Mam Tor, the Winnats and Castleton. History, Ethnology, and Geology. Professor W. Boyd Dawkins, F.R.S.

The Japanese Collection of the Bowes' Museum, Liverpool. Consul Bowes.
Silk Manufacture at Messrs. Broeklehursts' Mills, Macclesfield. Mr. Snow.
Heywood Technical School and Kay Library. Mr. A. W. Healey.

Hopwood Hall, the Natural History, Archeological and Byron Relics. The Secretary.

The British Association at Oxford. Mr. H. T. Crook (Delegate).

The Topography of the Kinderscout District. Mr. H. T. Crook, C.E.

Ardern Hall: Its History and the Family of Ardern. Mr. B. O'Connor.

Worsley Hall: Its Surroundings and the History of the Ellesmeres. Mr. W. Johnson and Mr. T. Farron.

The Liverpool Museum and its Ethnographical Collection. Councillor Picton, Dr. H. O. Forbes, LL.D., and Mr. Oliver W. Jeffs.

ASIA.

China, Corea, and Japan. Mr. J. Howard Reed.

Siam from a Lady's Point of View. Mrs. Unsworth.

Japanese Art. Mr. Consul Bowes.

The Country and People of Japan. Rev. W. Weston.

Ten Lectures on the Commercial Geography of Asia. Mr. A. J. Herbertson.

Japan and the Japanese. Mr. D. S. Brearley. (Communicated from Tyneside Geographical Society).

Armenia and Russia. Communications from Professor Minas Tcherez and Professor Vambery.

The Holy City of the Manchus—"Monkden." Mrs. Bishop.

AFRICA.

- The Suez Canal. Alderman Bowes.
The Proposed Dam in the Nile. Mr. H. T. Crook, C.E.
The Hinterland of Sierra Leone and the Recent Delimitations.
Lake Nyasa and the Portuguese Yao-land. The Venerable Archdeacon
Maples.
British Central Africa. Mr. J. Howard Reed.
The Mapping of Africa. General Chapman.
The West African Gin Traffic. (Communication from Bishop Tugwell).
The Reforms in Egypt.
Uganda. Rev. F. C. Smith, B.A. (Simisi).

AMERICA.

- The Upper Waters of the Mississippi and Lake Itasca. The Hon. J. V.
Brower.

AUSTRALASIA.

- Early Discovery and Missionary Work in New Guinea. Rev. S. Macfarlane, LL.D.
The Geography, Progress, and Value of New Guinea. Sir W. Macgregor, M.D., K.C.M.G.

THE POLES.

- The Year's Polar Expeditions. Mr. C. H. Warren.
An Antarctic Expedition. Mr. C. R. Markham, F.R.G.S.
Arctic Explorations. Mr. Delman Morgan, F.R.G.S.
The Proposed Expedition to the Antarctic. Mr. W. S. Bruce and Mr. J.
S. Keltie, F.R.G.S.

THE PACIFIC.

- Early Discovery and Missionary Enterprise in New Guinea. Rev. S.
Macfarlane, LL.D.
British New Guinea. Sir W. Macgregor, M.D., K.C.M.G.
The Arts and Crafts of the New Guinea Natives. Rev. S. Macfarlane, LL.D.

EDUCATION.

- The Position of Geography in Ordinary School Teaching. Mr. E. G. W.
Hewlett, B.A.

GENERAL.

- The British Association at Oxford. The Secretary.
The Yorkshire Mechanics' Union Annual Meeting. The Secretary.
The Lancashire and Cheshire Institutes' Union. The Chairman.
Petroleum: Its Uses Mechanically, Commercially, and Medicinally. Mr.
Derbyshire Maçall
Ethnology as shown by the Newly Re-arranged Collection at the Liverpool
Museum. Mr. H. O. Forbes, LL.D., and Councillor Picton.
Silk Manufacture. Mr. Snow (of Macclesfield).
Geography in Pictures. Mr. J. D. Wilde, M.A.
The Life History of a Mountain. Mrs. Leo Grindon.

Cotton Spinning. Mr. John Mortimer.

Questions for Discussion at the Geographical Congress. The President of the Royal Geographical Society.

The Work of the "Victorians." Mr. J. Howard Reed.

The Position of Geography as a School Subject. Mr. E. G. W. Hewlett, M.A.

The Transit of Mercury, November 11th, 1894. Mr. J. P. Thomson, F.R.S.G.S.

The London Meeting of the International Geographical Congress. The Chairman.

The Meeting of the British Association at Ipswich, and a description of the Town and of the Surrounding Country. The Delegate.

EXCURSIONS.

The Excursions of the Society have been of general interest to a large number of members. The various points of interest, such as the topography, local geology, botany, and zoology have been duly noted, and the archæological, technical, and industrial conditions of the places visited have been carefully observed. The historical relations of some of the places visited, and the folk-lore of the districts visited, also added to the value of the excursions. The following is a list of the most important.

Ardern Hall and the Reddish Valley. Leader, Mr. B. O'Connor.

Worsley Park, Gardens, and Neighbourhood. Leaders, Messrs. T. Farran and W. Johnson.

Liverpool Museum. Dr. H. O. Forbes, the Director.

The Manchester Gas Works. Councillor Sherratt.

The Edale Valley, Mam Tor, the Winnats and Castleton. Professor W. Boyd Dawkins, F.R.S.

The Japanese Museum. Consul and Mrs. Bowes.

The Technical School, Heywood. Councillor W. Healey, J.P.

Hopwood Hall and Park. Councillor W. Healey, J.P.

The Exhibition of Geographical Appliances at the International Congress of Geography. The Chairman and Secretary.

Birch Church and the Rectory Gardens. The Ven. Archdeacon Anson.

The Manchester Museum. The Secretary.

Peel Park Museum. The Secretary.

Ipswich. The Secretary.

A large number of members availed themselves of the assistance of the Society in various ways for their foreign journeys, and some of the members have prepared papers on their journeys. There was not any over-large party of members abroad this year.

CORRESPONDENCE AND OFFICIAL REPORTS.

The Society has been favoured with a large number of official reports from Foreign Governments. The correspondence from foreign societies and corresponding members and others has been very large, and of great value. The attempt made to obtain the British Bluebooks has so far practically failed, although we recognise their very great importance, and quite understand that a large proportion of those printed are wasted, yet we still are not able to obtain a grant of them from the Government.

THE JOURNAL.

Some delay has been caused in the issue of the Journals owing to the difficulty of obtaining sufficient workers in analysing the various foreign communications. It is a special work, and requires great care. If we had ample funds, this and other difficulties in relation to the Journal would easily be overcome, and we might hope shortly to have it published up to date. At present we can only do what we can, and work forward in hope of help.

GEOGRAPHY AT OWENS COLLEGE.

Mr. A. J. Herbertson has taken the place of Mr. Yule Oldham and Lecturer in Geography at Owens College, the Royal Geographical Society paying one half the salary and this Society paying the other moiety thereof. We hope to have good results from Mr. Herbertson's appointment to this office.

Except the "Victorian" prizes given at the Annual Children's Party, to the children who had best answered the questions in geography, consisting of books, atlases, etc., there were none others given. The Educational Committee considered that it would be well for the present to suspend the offering of prizes to schools; and as we have now sufficient information to enable us to test the value of the teaching of geography in primary and secondary schools they may be resumed later on in another form.

MEETINGS FOR STUDY.

Weekly meetings have been held during the winter for the study of questions prominent at the time. They have not been largely attended, but to those who have been present they have been of very great value. Exact knowledge on disputed matters has been gained. Mr. A. J. Herbertson has been of very great service in these meetings. A large number of maps have been prepared by him for the meetings.

THE SOCIETY'S NEW HOUSE.

The new rooms of the Society have been fully used, and have been found very comfortable by the members. It will be possible, without a very great expense, to hold meetings frequently and of various characters.

There is still large room for additions to the furniture, both for the library and map room; in fact both the library and map room are starved. We want for the library more shelves, glass cases to exhibit our curiosities, which are damaged if exhibited other than under glass; we wish to have a large amount of binding done now to preserve our books, and we want drawers and tables for the map-room, in which the maps may be kept in a proper and orderly arrangement. We also require some working tools for the map-room, but all these requirements have to stand over for want of funds. The accessions to the library from purchases, gift, and exchange are very large indeed.

The Society has reason to be very grateful to the numerous institutions, foreign governments, societies, and private individuals who are continually adding to its treasures. Books, papers, journals, maps, curiosities, furni-

ture, have all been added from these sources, and also by purchase; but at present the Society cannot afford to do very much in this way, other than in exceptional instances.

MEMBERS.

A considerable number have joined the Society during the year, but there has been some loss from resignations and deaths. Amongst those who have died during this year are some of our earliest members, and several members who have given great service to the Society. We mention with very great regret the following:—The Right Hon. Lord Aberdare, G.C.B., T. W. Clemson, H. H. Entwistle, J. D. Fairley, L. Frank, Hilton Greaves, D.L., J.P., James Horrocks, J. Thewlis Johnson, John L. Kennedy, J.P., Alderman C. Makinson, J.P., Right Rev. Bishop Maples, V. J. Moller, B. O'Connor, Alderman James Sidebottom, J.P., Joseph Thomson, F.R.G.S.

We trust the members will kindly remember that a constant stream of new members is needful if we are to be able to keep up our membership, and that not only is that requisite, but more than that, a large addition to the membership is necessary if the Society is to have the funds requisite to enable it to do the work absolutely required to be done in the various departments.

THE "VICTORIANS."

The "Victorians" have continued their useful work, and the Honorary Secretary has made a splendid report. The work is of a most valuable kind, and has in many ways greatly aided the Society.

The thanks of the Society are due to the Honorary Secretary and his band of assistants who voluntarily do this very acceptable work.

REPORT OF "VICTORIANS," 1895-96.

THE "Victorians" are pleased to be able to again report upon a very successful winter's work. In view of the extent to which the platform work had increased in the previous year, it was thought advisable, at the commencement of the season, to increase the strength of the lecturing section.

With this view, the Chairman, one of the Hon. Secretaries, and several other members of the Council, were good enough to join the "Victorians." The result has been eminently satisfactory, and the Society now possesses a powerful and earnest body of voluntary lecturers, who gratuitously supply their services in the interests of the Society and of Geographical Science. This is an educational development unparalleled by any similar society in the kingdom.

During the past winter no less than eighty-eight lectures (see summary) have been delivered in Manchester and the surrounding districts. Although the total number of meetings is six less than were held in the previous season the gatherings have been of a very much more important character.

All the meetings were well attended, and a very much larger number of people have been reached than ever before.

The audiences have varied from about 50 to 1,200 persons, the average number at each meeting being at least 300. Our lecturers, therefore, have succeeded in reaching between 25,000 and 30,000 hearers, and this fact alone speaks for the success of the efforts made for the spread of geographical information.

In eighty-one instances the lectures have been illustrated with lantern views, an increase of thirteen over the previous year. Only in seven cases have maps and diagrams only been used. This confirms the statement made above as to the increased importance of the meetings held. The Society's lantern has been used at twenty-eight of the meetings, and the Society's slides on forty-six occasions.

Sixteen of the lectures have been given on behalf of the affiliated societies, at Burnley, Eccles, Leigh, Meltham, Oldham, and Salford, and all of these meetings were a decided success.

The Working Men's Clubs' Association availed themselves of our services on thirty-one occasions, and each time a most successful meeting was held. On behalf of this association our lecturers have visited and spoken in the towns of Ashton-under-Lyne, Chadderton, Crompton, Clayton-le-Moors, Didsbury, Dukinfield, Greenfield, Hollingworth, Heaton Moor, Hooley Hill, Middleton, Oldham, Rochdale, Radcliffe, Styal, and Sowerby Bridge, in addition to various parts of our own city.

Most of these meetings have been organised by the Education Committees of the various Co-operative Societies. The "Victorians" are pleased to have been able to help materially in the educational work these committees are performing.

The remaining forty-one lectures have been given at the request of various members of the Society, and on their behalf our lecturers have addressed meetings in various parts of Manchester, as well as at Altrincham, Barton, Eccles, Edgeley, Heywood, Knutsford, Levenshulme, Liverpool, Middleton, Monton, Northwich, Radcliffe, Salford, Stockport, Warrington, and Wilmington.

Among the above it may be mentioned were seven meetings held in connection with two courses of geographical lectures given at Continuation Schools at Wilmington and Northwich. It will be remembered that in two previous years we have given courses of lectures at Wilmington. The four meetings held during the past winter at that place have, probably, been even more successful than on past occasions. They were much appreciated by the students, and highly spoken of by the authorities. On one occasion in the last series it happened that two Government inspectors paid a surprise visit to the school. They expressed themselves highly gratified with the geographical instruction which was being given, and on leaving the meeting sent a message to the students congratulating them on the means adopted to assist them in their geographical studies.

The three addresses forming the series given at Northwich were a new experiment. They proved very satisfactory, and were much appreciated by the students and the school managers. The experiment is likely to be repeated on a larger scale next winter.

Three lectures to the children of members—one held in Stockport—are also included in the figures given above.

Among the lecturing work undertaken by the "Victorians" at the request

of members has resulted in new members being added to the Society. Satisfactory as this result has been in the past, the "Victorians" feel assured that much more in this direction might easily be accomplished if the local members who organise the meetings would more earnestly follow up the efforts of the lecturers by asking their friends to allow themselves to be nominated for membership. It is also a mutual advantage for the Co-operative Societies, local clubs, and other similar organisations to become affiliated with the Geographical Society. One important object of the giving of lectures is attained when the Society's roll of members and affiliated societies increases as a consequence. The "Victorians" look for even better results in this direction in the future.

During 1895 lantern slides to the number of 516 were added to the Society's collection, at a cost of £10 14s.; also, a special lantern lens and a new lantern screen (both to suit the new library), at a further cost of £2 14s. These were purchased by the Council with the money handed over by the "Victorians," as mentioned in the balance sheet of last year.

During the past winter the "Victorians" have expended a further sum of £8 19s. 6d. on the making and purchase of 232 slides, and £1 8s. 6d. for a new lantern jet. They are also handing over £2 8s. to the Treasurer, which will wipe out the remainder of the debit balance of the lantern account which has appeared in the balance sheet in past years.

The "Victorians" are proud to know that the whole cost of the Society's valuable lantern plant, with the unique collection of some 1,700 slides (over £70 in the aggregate), has been met by the sums which they have been able to hand over from time to time. Doubtless the Society, as a whole, and certainly the Treasurer, will consider that the acquirement of so valuable an apparatus, without charge to the Society's funds, will in itself justify the existence and efforts of the "Victorians," quite apart from the educational value of the work they carry on.

The analysis of the various foreign, colonial, and home journals has again been made, and will appear in the *Journal* in due course.

A children's party was held during the Christmas holiday as usual, and was again a great success. The "Victorians" thank all those who helped them to entertain the young people on that occasion. They would especially thank Lady Leech for presenting the prizes, an anonymous lady for providing the Christmas cake, Miss Carrie Moore for organising dances and games, and Mr. G. A. Irlam for again appearing with his ever-fresh conjuring and ventriloquial entertainment.

Many other details of useful work might be referred to and enlarged upon did space permit. The members may rest assured, however, that the good work done in past years has not been allowed to flag during the winter just gone, but that the interests of Geography, and especially of the Manchester Geographical Society, have been pushed a substantial stage further during the season of 1895-96.

J. HOWARD REED,

Hon. Secretary.

56, Ducie Grove, Manchester, June, 1896.

SUMMARY OF "VICTORIAN" LECTURES, DELIVERED DURING
THE WINTER OF 1895-96.

DATE.	PLACE.	SUBJECT.	HOW ILLUSTRATED.	ON BEHALF OF	REMARKS.
1895.					
Oct. 1	Burnley	Old Edinburgh	Lantern Slides	Afil. Soc.	
" 2	Radcliffe	England to Japan	Do.	W.M.C.Ass.	Soc's. Lantern and Slides
" 3	Barton	Switzerland	Do.	A Member	Do.
" 8	Salford	India	Do.	Afil. Soc.	Do.
" 10	Chadderton	Battlefields of Europe	Do.	W.M.Clubs' Ass.	Do.
" 15	Middleton	Across Africa	Do.	Do.	Soc's. Slides
" 24	Liverpool	Sweden	Do.	L'pool Soc.	
" 28	Warrington	China, Korea, and Japan	Do.	A Member	Do.
" 28	Leigh	Polar Exploration	Do.	Afil. Soc.	Do.
" 28	Greenfield	Battlefields of Europe	Do.	W.M.Clubs' Ass.	Soc's. Lantern and Slides
" 29	Newton Heath	China, Korea, and Japan	Do.	Do.	Soc's. Slides
" 29	Whalley Range ...	The Congo	Do.	A Member	Do.
" 29	Hollingworth	Rocky Mountains	Do.	W.M.Clubs' Ass.	
Nov. 1	Heaton Moor....	Italy	Do.	Do.	
" 4	Leigh	Rocky Mountains	Do.	Afil. Soc.	
" 6	Winnington, Northwich	Genoa	Do.	A Member	Soc's. Slides
" 6	Eccles	Polar Exploration	Do.	Afil. Soc.	Soc's. Lantern and Slides
" 8	Lower Mosley St...	Genoa	Do.	A Member	Soc's. Slides
" 11	Hollingworth	Polar Exploration	Do.	W.M.Clubs' Ass.	Soc's. Lantern and Slides
" 12	Oldham	China, Korea, and Japan	Do.	Do.	Soc's Slides
" 14	Lever Street	Rocky Mountains	Do.	Do.	Do.
" 18	St. Stephen's, C-on-M.	Do.	Do.	A Member	
" 20	Didsbury	England to Japan	Do.	W.M.Clubs' Ass.	Soc's. Lantern and Slides
" 21	Mossley	Rocky Mountains	Do.	Do.	Soc's. Lantern
" 22	Stockport	Armenia			
" 23	Rusholme	Italy	Lantern Slides	A Member	
" 28	Rochdale Road....	The Congo	Maps & Diags.	Do.	
" 29	Levenshulme....	Rocky Mountains	Lantern Slides	Do.	
Dec. 2	Meltham	England to Japan	Do.	Afil. Soc.	Soc's. Slides
" 3	Salford	Nicaragua Canal	Do.	Afil. Soc.	Soc's. Lantern and Slides
" 3	Middleton	Italy	Do.	A Member	
" 4	Winnington, Northwich	England to Japan	Do.	Do.	Soc's. Slides
" 5	Salford	Belgium	Do.	Do.	Soc's. Lantern and Slides
" 7	Oldham	Iceland	Do.	Afil. Soc.	
" 7	Liverpool	Topographical Maps	Do.	A Member	Soc's. Slides
" 10	Burnley	Iceland	Do.	Afil. Soc.	
" 17	Knutsford	The Congo	Maps & Diags.	A Member	
" 18	Middleton	Polar Exploration	Lantern Slides	W.M.C.Ass.	Soc's. Slides
" 27	Society's Rooms ..	Geography in Pictures	Do.	Children of Members	Soc's. Lantern and Slides
1896.					
Jan. 4	Coal Exchange	Children's Party	Do.	Do.	Do.
" 9	Salford	Greenland	Do.	A Member	Soc's. Slides
" 13	Heywood	India	Do.	Do.	Do.
" 13	Collyhurst	Earth on Paper (Map Projection)	Diagrams	Do.	
" 14	Burnley	Uganda	Lantern Slides	Afil. Soc.	

DATE.	PLACE.	SUBJECT.	HOW ILLUSTRATED.	ON BEHALF OF.	REMARKS.
1896.					
Jan. 15	Didsbury	Cornwall	Lantern Slides	W.M.Clubs' Ass.	
" 16	Birch	Uganda	Do.	A Member	
" 16	Manchester	Do.	Do.	Members	Impromptu Meeting
" 17	Blackley	City Water Supply	Do.	A Member	Soc's. Lantern
" 18	Oldham	Rocky Mountains	Do.	A.M.I. Soc.	
" 22	Winnington,	The Far East	Do.	A Member	Soc's. Slides
" 22	Northwich	Uganda	Do.	W.M.Clubs' Ass.	Soc's. Lantern and Slides
" 22	Edgeley	Italy	Do.	A Member	
" 23	Rochdale Road....	Water Action	Do.	Do.	Soc's. Slides
" 27	Clayton-le-Moors ..	China, Korea, and Japan	Do.	W.M.Clubs' Ass.	Do.
" 27	Styal	Ben Nevis	Do.	Do.	
" 28	Tatton St., Man'ter	Rocky Mountains	Do.	A Member	
" 30	Eccles	Switzerland	Do.	Do.	Soc's. Lantern and Slides
" 30	Ashton-und'r-Lyne	Nansen and the North Pole	Do.	W.M.Clubs' Ass.	Soc's. Slides
Feb. 4	Oldham	Uganda	Do.	Do.	Do.
" 5	Northwich	India	Do.	A Member	Soc's. Lantern and Slides
" 6	Salford	Devon & Cornwall	Do.	Do.	Soc's. Slides
" 6	Sowerby Bridge ..	Polar Exploration	Do.	W.M.C.Ass.	Do.
" 6	Moss Lane	Italy	Do.	A Member	
" 8	Oldham	Petroleum Indust'y	Do.	A.M.I. Soc.	Soc's. Slides
" 10	Altrincham	Polar Exploration	Do.	A Member	Do.
" 10	Meltham	Manchester Ship Canal	Do.	A.M.I. Soc.	Do.
" 18	Hooley Hill	Canada	Do.	W.M.C.Ass.	Do.
" 18	Middleton	Old Manchester	Do.	A Member	Do.
" 18	Rochdale	Rocky Mountains	Do.	W.M.Clubs' Ass.	Soc's. Lantern
" 19	Winnington	Do.	Do.	A Member	
" 19	Didsbury	Old Manchester	Do.	W.M.C.Ass.	Soc's. Lantern and Slides
" 22	Monton	Nicaragua Canal	Do.	A Member	Soc's. Slides
" 26	Swinton	India	Do.	A.M.I. Soc.	Soc's. Lantern and Slides
" 26	Didsbury	Uganda	Do.	W.M.Clubs' Ass.	Do.
" 27	Ashton-und'r-Lyne	England to Japan	Do.	Do.	Do.
Mar. 1	Oxford Street			A Member	Sunday Address
" 2	Greenfield	Nansen and the North Pole	Do.	W.M.Clubs' Ass.	Soc's. Lantern and Slides
" 4	Northwich	Landscape Making	Do.	A Member	Do.
" 5	Salford	North Wales	Do.	Do.	Soc's. Slides
" 5	Stockport	Water Action	Do.	Do.	Do.
" 8	Radcliffe			Do.	Sunday Address
" 9	Crompton	Ben Nevis	Do.	W.M.C.Ass.	
" 11	Eccles	Iceland	Do.	A.M.I. Soc.	Soc's. Lantern
" 11	Dukinfield	Across Africa	Do.	W.M.Clubs' Ass.	Soc's. Slides
" 14	Oldham	Battlefields of Europe	Do.	A.M.I. Soc.	Do.
" 17	Hollingworth	China, Korea, and Japan	Do.	W.M.Clubs' Ass.	Soc's. Lantern and Slides
" 18	Northwich	The Congo	Do.	A Member	Do.
" 26	Ashton-und'r-Lyne	Liverpool to San Francisco	Do.	W.M.Clubs' Ass.	Do.

The Balance Sheet of the Society for 1895, with the Honorary Auditors' report, was submitted to the meeting and adopted.

BALANCE SHEET.

The Balance Sheet of the Society for 1895 has been prepared on a rather different basis from those issued formerly. A simplification has been made in the general balance account. The accounts have been audited by the Honorary Auditors, Messrs. Aldred and Gregory, who have for several years performed this service for the Society.

REVENUE ACCOUNT.

Dr.

JANUARY 1st to DECEMBER 31st, 1895.

Cr.

EXPENDITURE.			INCOME.			
£	s.	d.	£	s.	d.	
To Expenses of Meetings	107	11 6	By Subscriptions for year 1895—			
" <i>Journal</i> , April to December, 1894, less Advertisements and Sales	160	19 2	Ordinary Members	537	12 0	
" Salaries	110	10 0	Associate do.	90	6 0	
" Rent, Water, Gas, &c.	107	18 5	Societies (Affiliated)	12	12 0	
" Books, Maps, Binding, &c., for Library	15	18 7		640	10 0	
" Sundry Expenses—Stationery, Postage, Telegrams, Carriage, Cleaning, Wages, Coal, &c.	73	7 4	" Bank Interest	0	12 9	
" Commission and Expenses on New Members, and Collection of Subscriptions	20	15 3				
" Law Expenses	4	5 0				
" Arrears of Subscription written off	98	7 7				
" Balance—Surplus	39	7 6				
	0	10 0				
	<u>£641 2 9</u>			<u>£641 2 9</u>		
To Special Amount written off Arrears of Members' Subscriptions	£	s.	d.	£	s.	d.
" Stock of <i>Journals</i> written off	100	0	0	By Balance brought down	0	10 0
" Balance of Deficiency at December 31st, 1894	73	0	0	" Balance Transferred from Life Membership		
" Balance to General Balance Sheet	38	19	5	" Subscription Account	231	0 0
	19	10	7			
	<u>£231 10 0</u>				<u>£231 10 0</u>	

VICTORIA UNIVERSITY GEOGRAPHICAL LECTURESHIP ACCOUNT.

[illegible]

Dr. FURNISHING AND ALTERATION OF NEW PREMISES ACCOUNT, 1895. Cr.

	1895.	£ s. d.	£ s. d.
Dec. 31. To Balance of Contract and other Furnishing Expenses	175	9	9
Jan. 1. By Balance in hand			4 11 1
Dec. 31. By Donations received, as per list.....			120 6 0
" Balance owing to General Fund			50 12 8
		£175	9 9

LIST OF DONATIONS, 1895.

	£ s. d.	£ s. d.	£ s. d.
Mr. J. Ellis	50	0	0
" S. Oppenheim.....	10	0	0
" W. Holt.....	6	10	0
" A. J. S. Bles	5	0	0
" T. Denith	5	0	0
" H. Greaves, per exors.....	5	0	0
" H. Woolley, F.R.G.S.	5	0	0
" F. Zimmer	2	2	0
Councillor W. Sherratt, J.P.	2	2	0
Mr. P. Whyman.....	2	2	0
" E. Pukington, J.P.	2	2	0
Hob. W. Rothschild	1	1	0
Mr. J. Baddeley, J.P.	1	1	0
Councillor J. Berry.....	1	1	0
Mr. W. G. Black, F.R.S.E.....	1	1	0
" T. Costley	1	1	0
" W. C. Jones	1	1	0
" H. H. Melksham, J.P.	1	1	0
" W. J. Robertson	1	1	0
" G. H. Seed	1	1	0
" W. A. Waddington	1	1	0
" J. Wainwright, J.P.	1	1	0
Eccles Co-operative Society	1	0	0
Mrs. Peacock	1	0	0
Mr. John Walkden	1	0	0
Anon	0	10	6
Mr. J. E. Böhner, F.R.G.S.	0	10	6
" J. J. Cottrill	0	10	6
Mr. W. Johnson.....	0	10	6
" W. W. Kay	0	10	6
" W. H. Cowburn.....	0	10	0
" W. T. Evans	0	10	0
" Garthiot, Paris.....	0	10	0
Ald. W. Healey	0	10	0
Mr. T. Scott.....	0	10	0
Lieut.-Col. Watson	0	10	0
Mr. W. H. Williamson	0	10	0
Mr. B. Kershaw	0	5	0
" E. Smith	0	5	0
		£120	6 0

GENERAL BALANCE SHEET, DECEMBER 31st, 1895.

LIABILITIES.		ASSETS.	
£	s. d.	£	s. d.
To Subscriptions paid in advance	20 8 0	By Arrears of Members' Subscriptions	53 16 6
" Sundry Accounts Outstanding	49 2 6	" Lantern and Slides Account :—	
" Balance, as per Revenue Account	19 10 7	Balance from 1891	£4 10 8
		Additional Expenditure	13 10 9
			£18 1 5
		Less Amount received from the Victorians	16 0 0
			2 1 5
		" Amounts owing for Advertisements	6 0 0
		" Balances owing to General Fund :—	
		Lectureship Account :—	
		In Bank	£2 16 7
		Deficiency	2 3 5
			5 0 0
		New Premises and Furnishing Account :—	
		In Bank	£4 6 0
		Deficiency	50 12 8
			54 18 8
		" Cash in hand :—	59 18 8
		Bank	24 5 2
		Secretary	1 19 4
			26 4 6
			£148 1 1

NOTE.—The Furniture, Fittings, Books, Maps, &c., in Library, and Stock of *Journals* are not taken into account as assets in the above statement. There are 22 Life Members, whose subscriptions have been dealt with, as shown at foot of Revenue Account.

Audited and found correct,

Dec. 8th, 1896.

THEODORE GREGORY, F.C.A., }
WILLIAM ALFRED, F.C.A., } Hon. Auditors

The following ladies and gentlemen were elected to be the Council of the Society for 1896 and 1897.

THE COUNCIL OF THE SOCIETY FOR 1896-7.

President: His Royal Highness the Duke of York, K.G. Vice-Presidents: His Eminence Cardinal Vaughan, His Grace the Duke of Devonshire, K.G.; the Right Hon. the Earl of Derby, G.C.B.; the Right Hon. the Lord Egerton of Tatton, the Right Reverend the Lord Bishop of Manchester, the Right Hon. the Lord Mayor of Manchester, the Worshipful the Mayor of Salford, the Worshipful the Mayor of Eccles, the Worshipful the Mayor of Heywood, the Worshipful the Mayor of Oldham, the Principal of Owens College, the Right Reverend Monsignor Gadd, V.G.; the Right Hon. Sir James Fergusson, Bart., C.I.E., M.P.; the Right Hon. A. J. Balfour, M.P.; the Right Hon. Jacob Bright, Sir W. H. Houldsworth, Bart., M.P.; Sir Humphrey F. de Trafford, Bart.; Sir F. Forbes Adams, Kt., C.I.E.; Mr. F. Cawley, M.P.; Mr. C. E. Schwann, M.P.; Mr. C. P. Scott, M.P.; Alderman Sir Bosdin T. Leech, Kt.; Alderman Sir Joseph Leigh, Kt.; the Very Reverend L. C. Casartelli, M.A., Ph.D., Rector of St. Bede's College; Mr. Benjamin Armitage, J.P., Chomlea; Mr. Gilbert Beith, Mr. Frederic Burton, Professor W. Boyd-Dawkins, M.A., F.R.S.; Professor T. H. Core, M.A.; Mr. W. H. Holland, J.P., President of the Chamber of Commerce; Mr. J. E. Balmer, F.R.G.S.; Mr. C. H. Bellamy, F.R.G.S.; Mr. J. C. Blake, F.R.G.S., F.I.Inst.; Mr. G. T. Bowes, Alderman Isaac Bowes, Mr. H. T. Crook, C.E.; Miss Day, Girls' High School; Mr. J. C. Chorlton, Mr. Thomas Dentith; the Chevalier R. Froelich, K.C.I., Italian Consul; Mr. J. E. King, M.A., High Master, Manchester Grammar School; Mr. Joseph Hall, M.A., Head Master, Hulme Grammar School; Lady Bosdin T. Leech, Mr. Henry Lee, J.P.; Mr. William Mather, Mr. Samuel Ogden, J.P.; Mr. Herbert Philips, J.P.; Mr. Fritz Reiss; the Reverend S. A. Steinthal, F.R.G.S., F.I.Inst., Chairman of the Council; Mr. T. R. Wilkinson, Vice-Consul for the Ottoman Empire; Mr. F. Zimmern, Mr. D. A. Little, Mr. T. C. Middleton, J.P.; Mr. Harry Nuttall, Mr. J. T. Ogden, F.R.G.S., F.I.Inst.; Mr. R. C. Philips, Mr. J. Howard Reed, Mr. William Sherratt, J.P.; Mr. W. Angelo Waddington. Trustees: Mr. Sydney Keymer, F.R.G.S.; Mr. Councillor S. H. Brooks, F.I.Inst.; Mr. E. W. Mellor, J.P., F.R.G.S., F.I.Inst. Honorary Treasurer: Mr. S. Oppenheim, Vice-Consul for Austria-Hungary. Honorary Secretaries: Mr. F. Zimmern, Mr. J. D. Wilde, M.A.; Mr. J. Howard Reed ("Victorians"). Honorary Auditors: Mr. William Aldred, F.C.A.; Mr. Theodore Gregory, F.C.A.

The Secretary's Report and the Report of the "Victorians" for 1895 having been read and approved, the Secretary's Report for the year 1896 was read.

THE REPORT OF THE SOCIETY FOR 1896.

I have the honour to report that the work of the Society has been prosecuted with much vigour during the year, and with great comfort in the new rooms of the Society.

The following are the principal addresses given to the Society; but, in addition to these, a large number of short communications of an interesting nature have been made to the members at the various meetings.

340 *The Journal of the Manchester Geographical Society.*

Addresses given to the members in the Library and elsewhere during the year:—

EUROPE.

Podgers in Norway (an account of some districts in Norway not often visited).

Mr. F. S. Oppenheim, B.A.

Earthquake in Iceland (1896). Mr. F. K. Newby.

The Canals and Navigable Rivers of England. Mr. L. B. Wells, M.Inst. C.E.

County Antrim and the North West of Ireland. Mr. W. Gray, M.R.I.A.

The Surface Geology of Rossendale. Mr. H. Bolton, F.R.S.E.

An Unfrequented Corner of North Italy. Mr. E. W. Mellor, J.P., F.R.G.S., etc.

The Brontë Country. Dr. J. A. E. Stuart, F.R.S. Scot.

A Thousand Years of Hungarian History. Mr. E. Sowerbutts, F.R.G.S.

Madeira and the Canaries. Rev. S. A. Stenhal, F.R.G.S.

Old Manchester. Mr. J. D. Wilde, M.A.

Turkey and Greece. Dr. and Mrs. Oram.

An Old Manchester Parish. Rev. John Henn.

St. John's Church and its Memorials. Rev. F. B. Leach.

The History and Development of Liverpool. Mr. E. Sowerbutts, F.R.G.S.

The History of Stockport; the Parish Church and its Memorials. Rev. Canon Symonds, M.A., and Mr. I. Wilde.

ASIA.

Life in China. Rev. J. Galpin.

The Holy Land. Dr. and Mrs. Oram.

Life in Cashmere. Rev. J. S. Doxey.

AFRICA.

Eight Years in South Africa. Rev. Alvan Spencer.

British East Africa. Rev. T. Wakefield, F.R.G.S.

The Niger Territories. Mr. J. Hampden Jackson.

The Mendi Country. Rev. W. Vivian, F.R.G.S.

AMERICA.

The Nicaragua Canal. Mr. Alderman Bowes.

AUSTRALASIA.

Recent Journeys of Sir W. Macgregor in New Guinea. Mr. J. P. Thomson, F.R.G.S., etc.

Travel and Adventure in New Guinea. Mr. H. O. Forbes, LL.D., F.Z.S.

Australia: Its History and Progress. Mr. W. Harper.

Queensland. General Sir H. W. Norman, G.C.B.

ARCTIC AND ANTARCTIC.

A Voyage to the Arctic Circle. Mr. T. Weir.

GENERAL.

Map Projection (with diagrams). Mr. J. Howard Reed.

Earth Movements and Earthquakes. Dr. John Milne, F.R.S.

Electricity in the Service of Man. Mr. C. Clarke.

The Whitworth Institute. The Secretary.

The Lancashire and Cheshire Union of Institutes. Rev. S. A. Steinthal, F.R.G.S.

The Yorkshire Mechanics' Institute Union. Mr. J. D. Wilde, M.A.

The British Association at Liverpool. The Secretary.

A Sand Box (demonstration in Geography). Miss Edith Wilkinson.

Some Manners and Customs of Savage Races. Mr. B. H. Mullen, M.A. (Dub.).

The Manchester Art Museum and the Work of the University Settlement. Mr. George Milner.

EXCURSIONS IN 1896.

The following excursions have been made; some of the parties were very large.

In reference to foreign travel it is with great pleasure that notes of introduction given to our members travelling abroad to the officers of corresponding societies have been met by the exercise of great kindness to our members, which the Society will be very glad to reciprocate to the members of the corresponding societies as opportunity may serve.

Several very interesting excursions were made at home, but it is curious to note that several excursions asked for by some members had no response when the arrangements had been made, and they fell through. The visits to a large number of Institutions were much enjoyed and were of great value in many ways. In every case the members have been received with courtesy, and in many cases with extraordinary kindness. The visit to Dore will long be remembered from the kindness of Miss Reed and of Mr. J. F. Atkinson, J.P., and of Mrs. Atkinson.

FOREIGN.

St. Petersburg, Moscow, and Finland.

Budapest (the Exhibition of Hungarian Products, etc.).

Belgium and Holland.

The Rhine.

HOME.

The Brontë Country round Cleckheaton.

Dore and Beauchief.

Congleton and Moreton Old Hall.

Twenty-five Miles' Drive through Rossendale.

Stockport.

St. John's Church.

INSTITUTIONS VISITED.

The Whitworth Institute, Park, and Water Colour Exhibition.

The Manchester Art Museum.

The Manchester Museum—General Visit.

The Manchester Museum—Geology of the Rossendale District.

The Manchester Museum—The Petrie Collection.

The Royal Salford Technical School.

The Manchester Cold Storage and the Mode Wheel Lairages.

The Manchester City Art Gallery.

THE JOURNAL.

In 1896 there were issued to the members the following parts of the Journal:—Vol. XI., 1 to 3, January to March, 1895; Vol. XI., 4 to 6, April

to June, 1895; Vol. XI., 7 to 9, July to September, 1895. Vol. X. supplement to parts 9 to 12 completing Vol. X. The completing parts for Vols. XI. and XII. will not be published for some time yet. They are in progress, but are difficult to complete.

CORRESPONDENCE.

An active correspondence of a most interesting and valuable kind has been maintained during the year with foreign correspondents, corresponding societies, officials in our Colonies, and with missionaries in the foreign field.

THE LIBRARY

is now being largely increased. Almost every day by exchange, by gift, or by purchase, additions are being made, and it will very soon be needful to consider the provision of larger premises for the library and for other purposes.

MUSEUM.

We have by the kindness of some members and friends commenced a collection towards a Geographical Museum; this department is also growing. But we also would very much desire, if we had the room and the necessary funds, to provide a Commercial Museum. This idea is quite in accord with the objects of the Society, and would be of the very greatest importance to the members.

We had hoped that the Corporation might provide this in connection with the Technical School or the Whitworth Trustees, but that seems now to be quite hopeless, and if it is done at all we shall have it to provide for ourselves. The Council will, I am sure, be glad to receive suggestions from the members in reference to the matter.

MEMBERSHIP.

We have had a large number of new members, which is a cause of congratulation; but the death-rate amongst our members is very large, and with very great regret we announce the deaths of the following members during the year 1896:—Messrs. J. A. Beith, W. J. Burton, T. Camm, R. Davies, R. Done, Consul F. Holmwood, J. D. Hague, W. R. Keyte, J. E. Lightbown, Alvan Millson, Baron F. von Müeller, Councillor Roper, Dr. Alberto Sanchez (San Salvador). We are very sorry to lose these and other valued friends, and shall be glad if new members come forward to take their places.

THE "VICTORIANS."

The "Victorians" work has again been very active this year, and Mr. J. Howard Reed, the Honorary Secretary, has furnished the following report:—

REPORT OF "VICTORIANS" 1896-97.

The "Victorians" have pleasure in reporting upon a very successful winter's work carried out during the past season. The number of lectures given has not been so quite so large as in some previous years, but the work, on the whole, may be considered to have in no way fallen short in general importance and value. Seventy-one lectures in all were

delivered during the winter, and no less than sixty-six of these were illustrated with lantern slides; maps and diagrams only being used for the remainder.

The whole of these lectures were well attended, in many cases the audiences being large and crowded. During the winter our lecturers, in addition to the work done in the Manchester district, have spoken in the following places:—Ashton, Adlington, Altrincham, Burnley, Blackpool, Crompton, Chorlton, Chadderton, Clayton-le-Moors, Dobcross, Didsbury, Eccles, Hollingworth, Heswell, Levenshulme, Leigh, Liverpool, Monton, Mossley, Meltham, Oldham, Pendleton, Partington, Rochdale, Sale, Salford, Walkden, and Warrington.

Thirteen of the lectures were given on behalf of affiliated societies, and were very successful. The Working Men's Clubs' Association arranged twenty-six of the meetings, no less than twenty of these being for Co-operative Societies. The "Victorians" have long been of opinion that these commercial societies should become affiliated with the Manchester Geographical Society, and so be able to arrange for "Victorian" lectures direct. They would, at the same time, be able to reap to the full the other advantages which our Society offers, and which are much prized by those societies which have already taken up affiliation. Three other lectures were given on behalf of Co-operative Societies, but in these cases the arrangements were made direct, owing to affiliation having been effected.

Addresses have been given on the application of members of the Society in no less than thirty-two cases. Four of these were given as a course at the Continuation Schools at Winnington connected with the works of Messrs. Brunner Mond and Company, Limited. This special work has now been carried on for several years, as will be well known to all the readers of these annual reports. The "Victorians" are proud to think that they have succeeded in keeping up the high character of these strictly educational addresses, and are pleased to know that they are highly appreciated by the school managers, and by the students themselves. As on a former occasion, two of Her Majesty's school inspectors attended at one of these meetings, and expressed themselves as highly gratified and impressed with what they heard and saw.

The "Victorians" wish to express their thanks to Mr. Thomas Weir, Hon. Secretary of the British Astronomical Association (Northern Branch), for having placed his services at their disposal on several occasions during the past winter. They assure him that his lecture on his visit to Norway with the eclipse expedition of 1895 has met with much appreciation. Several members of our own Society, other than "Victorians," have also given valuable assistance in the winter's lecturing work, and the "Victorians" wish to put on record their thanks to these gentlemen, and, in one case, a lady.

The analysis of the various British, colonial, and foreign journals and proceedings is again being carried out by the "Victorians," and will be duly published in the *Journal*.

At the last meeting of the British Association, held in Liverpool, a paper, prepared by the Hon. Secretary, was read, dealing with and explaining these two branches of geographical work carried on by the "Victorians." It is interesting to know that this excited considerable

discussion, and is likely to lead to the development of similar effort in other districts. The paper has been recently reproduced in our own *Journal*, under the title of "Practical Geography in Manchester," and was favourably referred to in the *Journal of the Royal Geographical Society*, and in the daily press at the time. Already several requests have been received for copies of the paper in question, with a view to the organisation of the same kind of work in Edinburgh, London, and other places.

During the Christmas season the usual children's party was held at the Coal Exchange. This was largely attended, and was a great success. The "Victorians" wish to express their thanks to Mrs. Zimmern, who kindly gave and distributed the prizes on that occasion, and to several other ladies and gentlemen who assisted in the entertainment and amusement of the young people.

The "Victorians" were pleased to be able to render the Society assistance at the great Nansen demonstration held in the Free Trade Hall in February, and they trust that to their efforts may be ascribed some of the success that attended upon that unique geographical effort. They are proud to think that one of their own most popular lecturers, Mr. G. H. Warren, was able to render substantial assistance by describing Dr. Nansen's journey and slides to the large overflow meeting which assembled in the smaller hall on that occasion. They would like, also, to express their indebtedness to Mr. J. D. Wilde, for the serious work he undertook and carried out so well, and with such pains, in preparing the big Polar map on their behalf for the same great demonstration.

The "Victorians" feel that they cannot let the occasion of their annual meeting pass without expressing their profound concern at the serious illness which has overtaken their Chairman, pioneer, and enthusiastic worker, Mr. Eli Sowerbutts. They are all fully alive to the fact that but for his brilliant ability and untiring zeal the useful and practical geographical work which has been conducted by them would never have been undertaken or carried on. They sincerely trust that his enforced cessation from active work may be only temporary and of short duration, and that they may shortly again have the pleasure of seeing him able to renew the work which his ability and devotion have done so much to sustain, and that they may have the gratification of again standing with him shoulder to shoulder in further developing with vigour the organisation which he himself initiated, and in which he has always taken the foremost place, and set the most brilliant example of personal devotion.

J. HOWARD REED,

Hon. Secretary.

56, Ducie Grove, Manchester, July, 1897.

The Reports for 1895 and 1896 and Balance Sheet for 1895 having been read, they were adopted.

The Adjourned Annual Meeting was held on Saturday, March 13th, 1897, at 3 o'clock, in the Library. The Rev. S. A. STEINTHAL in the chair.

The balance sheet for 1896 was submitted to the meeting, with the report of the honorary auditors, and was adopted unanimously.

REVENUE ACCOUNT.

JANUARY 1st TO DECEMBER 31st, 1896.

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CR.

EXPENDITURE.		INCOME.	
£	s. d.	£	s. d.
To Expenses of Meetings.....	119	5	9
„ <i>Journal</i> , January to December, 1895, less Advertisements and Sales.....	179	1	4
„ Rent, Rates, Gas, Water, Insurance.....	105	19	7
„ Salaries.....	110	10	0
„ Books, Maps, Bindings, &c., for Library.....	12	12	5
„ Sundry Expenses, Stationery, Postages, Telegrams, Cleaning, Wages, Coal, &c.	74	9	8
„ Commission and Expenses on New Members and Collection of Subscriptions	15	0	2
Balance to General Balance Sheet—	89	9	10
From 1895	19	10	7
December 31st, 1896.....	0	5	5
	19	16	0
	£636	14	11
	£616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
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	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
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	616	12	0
	0	12	4
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	509	9	0
	71	9	0
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	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
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	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0
	616	12	0
	0	12	4
	19	10	7
	21	0	0
	509	9	0
	71	9	0
	14	14	0</

VICTORIA UNIVERSITY GEOGRAPHICAL LECTURESHIP ACCOUNT.

Dr.		Cr.	
1896.		1896.	
Jan. 1.	To Balance owing to General Fund	£	s. d.
		2	3 5
Dec. 31.	To Sundry Expenses	2	15 6
		<hr/>	
		£4	18 11
		<hr/>	
		£	s. d.
		1	1 0
		1	1 0
		<hr/>	
		2	2 0
		2	16 11
		<hr/>	
		£4	18 11
		<hr/>	

FURNISHING AND ALTERATION OF PREMISES ACCOUNT, 1896.

Dr.		Cr.	
1896.		1896.	
Jan. 1.	To Balance owing to General Fund	£	s. d.
		50	12 8
		<hr/>	
		£50	12 8
		<hr/>	
		£	s. d.
		5	0 0
		2	2 0
		1	1 0
		1	1 0
		<hr/>	
		9	4 0
		41	8 8
		<hr/>	
		£50	12 8
		<hr/>	

GENERAL BALANCE SHEET, DECEMBER 31st, 1896.

LIABILITIES.		ASSETS.	
	£ s. d.		£ s. d.
To Subscriptions paid in advance.....	32 0 6	By Arrears of Members' Subscriptions	44 2 0
" Sundry Accounts outstanding.....	63 9 11	" Lantern and Slides Account :—	
" Balance, as per Revenue Account	19 16 0	Balance from 1895	£2 1 5
		Less received from Victorians	2 1 5
		Accounts owing for Advertisements.....	6 3 0
		" Sundry Accounts owing.....	1 17 4
		" Balances owing to General Fund :—	
		Lectureship Account :—	
		In Bank	£4 18 7
		Deficiency	2 16 11
		New Premises and Furnishing Account :—	7 15 6
		In Bank	£2 9 0
		Deficiency	41 8 8
		Cash in hand :—	43 17 8
		In Bank.....	£15 8 10
		Less owing to Secretary	3 17 11
	<u>£115 6 5</u>		<u>11 10 11</u>
			<u>£115 6 5</u>

NOTE.—The Furniture, Fittings, Books, Maps, &c., in the Library, and Stock of *Journals* are not taken into account as assets in the above statement. There are 24 Life Members, whose subscriptions have been taken as revenue.

Audited and found correct,

THEODORE GREGORY, F.C.A. } Hon. Auditors.
WILLIAM ALDRED, F.C.A. }

March 8th, 1897.

It was also resolved that this meeting be adjourned to an early date in 1897 to receive the balance sheet for 1896, and that thenceforth the usual time for the annual meeting should be as early as possible in the year. It was suggested that the annual meeting should be made a more important function, and the matter was referred to the Council for consideration.

Very hearty thanks were given to the Council, the Officers, and to the Auditors of the Society for their past services, and to the Chairman for presiding at this meeting, and for his great services to the societies.

SARAWAK AND NORTH BORNEO.

THE NATIVES OF SARAWAK AND BRITISH NORTH BORNEO. Based chiefly on the MSS. of the late Hugh Brooke Low, Sarawak Government Service. By HY. LING ROTH. With a Preface by ANDREW LANG. Two Volumes, Super-Royal 8vo., 1,035 pages. Price 50s. London: Truslove and Hanson, 143, Oxford Street, W., and 6, Sloane Street, S.W.

THERE are over 500 Illustrations; of these some 450 are original. The greater part of the original line drawings have been prepared by Mr. Charles Prætorius, whose skill in this class of work is well known in the Antiquarian Department of the British Museum and at the Society of Antiquaries. The Photographic Illustrations have been reproduced by Messrs. André and Sleigh, Ltd., and the Map prepared by Mr. Stanford.

This handsome work has been generously placed in the Library by Mr. Alderman Galloway, J.P., of Preston.

It is a book full of interesting matter, and is beautifully illustrated.

No complete work dealing with the Natives of British Borneo exists. Books there are indeed which give considerable account of the people, but such are not by any means exhaustive. Moreover, many of these books are now out of print and very inaccessible, while much valuable original information is continually appearing.

It may be asked of what good is such a work as this? Its uses are manifold, and it is hoped that it will bring before many some knowledge of the arts of these savages—and parenthetically it may be remarked their arts are of no mean order. But by far its most important mission is to familiarise us with the habits of thought, customs, and general methods of life of our fellow subjects. At times like the present, when there is so much agitation going on for giving the powers of self-government to Asiatics, a thorough knowledge of these people cannot possibly be out of place. Apart from this question, Sarawak and British North Borneo are valuable Colonial possessions—possessions which that growing Eastern Power has already made a bid for. Day by day the importance of our Colonies is growing upon the mind of the British public, and a knowledge of the people who inhabit them must help to further our interests. The early days of all our Colonies are surrounded by romance, but no one of them has had such a romantic beginning as Sarawak.

The history of the whole of British Borneo has been completely changed by Sir James Brooke, and his nephew and successor as Rajah (Sir Charles Brooke).

In this work the distribution of the various tribes is dealt with very fully. An examination of the use of the word "Dyak" is entered upon, and evidence is adduced to show that by travellers and writers the term has been much misapplied.

The character of the people is fully illustrated by anecdotes and by reference to the observations of those who have had the best opportunities of studying and noting it.

The habits and customs of the people, beliefs, legends, agriculture, weapons of war, and government are stated in great detail.

The last chapter in the book, on the Language, containing extensive vocabularies, invites the attention of the linguist and philologist.

The volumes are the ripe fruit of great study, and gather in one bunch the work of many predecessors in the same field of research.

PROCEEDINGS OF THE SOCIETY.

OCTOBER 1ST TO DECEMBER 30TH, 1896.

The 403rd Meeting was held in the Memorial Hall, on Wednesday, October 7th, 1896, at 7-30 p.m. The Rev. S. A. STEINTHAL in the chair.

General Sir HENRY W. NORMAN, G.C.B. (Ex-Governor of Queensland), Honorary Member of the Society, addressed the members on the "Colony of Queensland." (See page 82.) The address was illustrated with a large map lent by the Agent-General of Queensland; another large map, presented to the Society by the Government of the Colony; several smaller maps, and a number of lantern views specially prepared for the meeting.

A very hearty vote of thanks was passed to Sir Henry Norman and to the Agent-General on the motion of Mr. Alderman BOWES, seconded by Mr. DREYDEL. Sir HENRY NORMAN responded.

The 404th Meeting was held in the Library, on Monday, October 12th, 1896, at 7-30 p.m. Mr. JOHN SNADDON in the chair.

The minutes of Meetings 389 to 403 were read and approved.

The election of the following members was announced:—

ORDINARY: Rev. A. B. BATER, Messrs. Joseph Barrington, William H. Dixon, Thomas A. Holland, W. H. Holland (President of the Chamber of Commerce), J. E. King, M.A., John Leigh, J. E. Lightbown, E. L. Lombard, Richard Millers, Alderman Mottram, O. Schuster.

ASSOCIATE: Mr. A. Harrison.

LIFE: Professor Angel Ma. Diaz Lemos, Dr. Alberto Sanchez.

CORRESPONDING: Mr. A. Pingstone (Buluwayo), Mr. W. B. Leech (Bonthé, Sherbro).

HONORARY: His Excellency Governor Maxwell (Lagos).

A paper from Bishop Hanlon, Mengo, Uganda, dated June 18th, was read. (See page 79).

Two communications from the Rev. F. C. Smith, B.A., F.R.G.S., F.Z.S., on "Birds of Eastern Equatorial Africa," and "Rats and Elephants in Central Africa," were read. (See pages 74 and 76).

Mr. CHARLES A. CLARKE (one of the "Victorians") then read a paper on "Electricity in the Service of Man" (see page 159), and illustrated his address with views, diagrams, models, and detailed plans of the electrical machinery of the cities of Cologne and Amsterdam.

After some discussion, Mr. SCOTT moved, and Mr. JACOBY seconded, a vote of thanks. Mr. CLARKE responded.

The 405th Meeting was held in the Library, on Wednesday, October 21st, at 7-30 p.m. The Chevalier FROEHLICH in the chair.

The minutes of the 404th Meeting were read and approved.

Dr. and Mrs. ORAM addressed the Society on "A Recent Voyage in the Eastern Mediterranean," including Greece, Constantinople, Smyrna,

Jaffa, Jerusalem, Jericho, and Egypt; returning through Italy. A large number of lantern views were exhibited, prepared by Mrs. Oram from photographs taken by her on the journey. A number of curiosities and photographs were placed on view.

NOTES OF A TOUR IN THE EASTERN MEDITERRANEAN.

By DR. AND MRS. ORAM.

THE seven weeks' tour, of which these joint notes of my wife and self are but a few happy memories, commenced on Friday, the 21st of February, by taking the Dover and Calais boat, and, with but a few hours' stay in Paris, pressing on to Marseilles; so, reaching that fine and flourishing town by



A COUNTRY ROAD ON THE WAY TO JERUSALEM.

three the next day, with no waste of time we joined the yacht at once, and within the hour were steaming past Monte Cristo's famous prison isle, and by the time dinner was announced were well on the way to the Straits of Bonifacio, separating Corsica and Sardinia.

This is rather a rapid way of passing through an interesting country, we confess; but, having seen Paris and Marseilles before, and having encircled the western basin of the Mediterranean Sea, we were anxious to give all available time to its eastern basin and the Holy Land lying beyond. The railway journey was, fortunately, a very pleasant one, and doubtless in summer time would be a delightful one, but in February it had but little charm for the eye, the one point of interest being the ruined amphitheatre at Arles.

Sunday mid-day found us entering the beautiful Straits of Bonifacio, which were much wider than we had anticipated, and beautiful though they were we preferred the view to the north of the island. Doubtless again this, like the dulness of the Bay of Naples, the greyness of the mountain slopes, and the snow and muddiness of Constantinople, instead of the glorious beauty we had anticipated, were all due to the unfavourable time of the year, and unavoidable if we were to see Palestine and Egypt at their best.

By this time most of our party were confined to their cabins, and on reaching Naples five of our party had had enough of it, and elected to stay behind. We tried to persuade them that 'twas better on before, but it was no good: so, with tears, we left the five with a number six, to whom we entrusted them as to a Greatheart, he being also a colonel in the Guards, while we continued on our way by land and sea on our pilgrim journey to the glorious land.

The day at Naples was spent most happily in wandering over the famous excavations at Pompeii. The temples, amphitheatre, and forum were, of course, most interesting, but all paled before the restored and newly-discovered nobleman's house. This is really most remarkable, the inner gardens being kept in order, the statuary and wall paintings being still perfect, and even the petrified food being on the cooking stove in the servants' apartment. Several bodies were found inside the door, presumably those of female slaves who did not dare to flee.

Returning to Naples, the picture galleries, and curios, and sculpture at the Museum filled the remaining hours of the afternoon, the sculptured gems and one complicated surgical instrument of a gynecological description being of most beautiful workmanship. We were fortunate enough to witness from the balcony of the Museum a magnificent funeral of an admiral of the Italian fleet, attended by the king and court. Its picturesqueness was indescribable, and we were carried far away back into mediæval times. Crowds of associates of the *Misericordie* surrounded and followed the hearse, hooded and cowed in grey, with large holes for their eyes, reminding us of the pictures of one's childhood of the familiars of the Inquisition. Every kind of guild, accompanied by their banners and numberless and exquisite garlands of flowers, the king's bodyguard in glorious array, and troops and regiments of soldiers and sailors. An immense number of bands took part, and the whole formed a scene which has fixed itself in our memories for a lifetime.

Up to the last couple of years Naples was notorious for its bad water and its evil smells. Now it has a daily supply of water almost equal in quantity and quite equal in quality to our Thirlmere supply, and its new drainage system is one of the finest in the world; it has also the most splendid Royal Exchange and Arcade in the world.

Vesuvius was looking at its best, four outbreaks being visible, the fierce red glow of the molten lava having a very fine effect across the bay. A closer view of the crater we, unfortunately, had to postpone until our return visit, and then it turned out to be impossible, the German Emperor being at the summit and a guard of soldiers round the base.

The boat passed onward through the Lipari group, our old friend Stromboli keeping in sight for some time, with its overhanging cloud of volcanic smoke, and we were all glad when we reached the shelter of the Straits of Messina. The weather fortunately cleared, and we had a

view of the snowy heights of Etna; very imposing indeed they were, and we should have been sorry to have missed the view.

The weather rapidly improved for our run across the Adriatic to Corinth. Cephalonia came in sight, the wonderful island where the sea runs into the land, instead of the rivers running into the sea, with sufficient force and fall to turn the water-wheels of a couple of corn mills; and on the left Zante, the island where our friends and fellow-travellers on another yacht finished their tour by getting wrecked a week or two later.

Ithaca was an old friend, and so saluted, the Odyssey still being the best and only guide there is to it. Missolonghi and Patras followed on either hand, and night came on as we pleasantly steamed up the Gulf of Corinth.

We slowly glided up to the entrance of the canal at midnight, and after a considerable delay, due to their objection to vessels passing through by night, special permission was telegraphed to us from some high official, and we passed on through the entrance in solemn silence. Few would believe how impressive the journey through this canal by moonlight is. Although so new, it is more weird than any tomb in Egypt. The solid rock on each side of the narrow passage towers far above the masthead of the boat and only whispers are heard; the solemn silence of midnight creeps round one's heart; no sign of life is visible, and the vessel steams so slowly that one seems to be moved along by an invisible power into the secret penetralia of some mystic region of long ago. With a sigh we passed into the open air again, and the sensation was a thing of the past. Strange that the new things of Greece strike the imagination far more forcibly than do the old, and one leaves this lovely land with the idea that fairy-land is not even yet an impossibility; fifty years ago Athens was a collection of miserable buildings, and now it is loveliness itself. But it is to a great extent a modern loveliness, its ancient statues and sculpture adorning other cities of Europe, and few indeed are to be seen at this ancient centre of art. We think, however, that its exceeding whiteness may pall after a time, as we were assured that in six months' time we should probably prefer a larger and dirtier town as a residence.

We spent but little time at the Piræus, each morning either taking an early train into Athens, a distance of eight miles or so, or driving by road, returning in the moonlight, which is decidedly preferable, and takes but little longer. It is well, by the way, to remember that paper money here is at a discount of seventy per cent, and the man who does not remember that and pays for everything in silver will soon be like Mark Twain's man, who wasted a large legacy in paying his small debts. The kindness and courtesy we experienced in Greece were beyond description, from the officials of the House of Representatives down to the very cabman, and we take this opportunity of expressing our very grateful thanks.

Having so short a time to spend in Greece, we devoted it entirely to Athens. Others of our friends ascended Pentelicon or went along the sacred way by Daphne to Elensis. The Acropolis we explored both by daylight and by the light of the moon, and by far the most exquisite and bewitching sight we have yet seen was the view of Athens at midnight as we slowly drove up the winding path to the entrance gate, and the illuminated city lay beneath us.

Walking up the main street, the lovely little gem-like church of Kapnikarea, one of the few real old Byzantine churches still extant, blocks the

way. It looks as if it had been accidentally dropped there, like some exquisite sea-shell, and had nothing to do with the surrounding whiteness. We were fortunate enough to hit upon another funeral near here in a rather large and imposing church close by. The music was very grand and beautiful, but the really remarkable thing was the survival of the ancient custom of the funeral eaters in the shape of an immense cake made of wheat and honey, placed on a sheet in front of the coffin. At the conclusion of the service, it was tossed into the air, and the assembled congregation scrambled for the fragments.

The Byron statue was unveiled as we left, unfortunately too late for us to view it. The Stadion was in an advanced state of preparation, and was far beyond what we expected to see. One of us delighted the crowds of onlookers by going round it at full speed, amid encouraging cries of "Combatant! combatant!" The Zappeion or Exhibition Building is well placed and imposing, but the Academy is absolutely perfect. This building, the Polytechnic, and the new Museum form a range of buildings as perfect as could be desired. The Royal Palace, on the contrary, is a tasteless block of marble, which offends one all the more as the blocks forming it have been blown out of the quarry with dynamite, instead of being carefully cut out as in the days of old.

We spent an evening in the House of Representatives, which is conducted in the French style. Not much attention was paid to the speakers by the House, however, while we were there, the sight of a gentleman in the ladies' box acting upon their feelings nearly to the same extent as the sight of a gentleman sitting with his wife acts upon the feelings of the vergers in Gloucester Cathedral nearer home. So we took pity upon them and left. We had an invitation for a concert at the Odeon for the remainder of the evening, at which the royal family and "everybody" were to be present; but, unfortunately we had no time to return to the Piræus to dress, and could hardly go in tourist costume.

Returning to the Piræus, we sight the point to which Sir Richard Church and Admiral Cochrane advanced with the Philhellene Army in 1827, and were annihilated. Peace be to their ashes. That they did not beat the Turks was not their fault; they, at least, tried.

We sailed away across the Ægean Sea until we came in sight of the Plains of Troy, with Mount Ida in the background. Passing along the coast, one thinks with interest of the heroic deeds performed there in the olden days—deeds which would have but a schoolboy interest for us were it not for those two wonderful cups in the Schliemann collection—cups of gold worthy of the foremost place in the Windsor dinner-service, which seem to defy one to say it is all legendary and poet-made. To tell the truth, there is nothing in this marshy little plain to attract attention otherwise, but so they may say of Manchester in the distant future.

A matter of far deeper interest at present is the fact that the Mediterranean Sea runs up into the Sea of Marmora at the rate of about two miles an hour, although the upper current is an outer one. This appears to be a fact not taken sufficiently into consideration in the question, Can the Dardanelles be forced? and a very little electric power for steering purposes should be able to carry a submarine boat through the straits unseen.

Every ship has to anchor under the guns at the little village of Dardanelles midway to receive formal permission to proceed. The villagers come

off in boats, with evil-looking four-footed beasts made of crockery-ware. These must be the local idea of the nature of a dog, as the real articles in Constantinople were rather handsome than otherwise.

A few more forts, and we were in the Sea of Marmora, and nothing more of interest was seen until we neared Seraglio Point, and, rounding it, cast anchor in the Golden Horn. The Old Seraglio of so many bloody memories is seen occupying the point, and few obtain a closer view of it, the Sublime Porte cherishing its associations, and charging £5 admission to keep it select. It is a gloomy-looking building, and the greater part has been burned down.

The first feeling, at any rate in February, is one of disappointment, but this soon passes away, and in the afternoon, with the rays of the setting sun, one can imagine what a glorious place it must appear on a summer's day. The Dolmabahçe Palace and the mosques perhaps strike one's eyes more than all else, but the bird's-eye view obtainable from the heights above Pera is most remarkable.

A careful pocketing of passports, six-barrelled or otherwise, and the dragoman we have selected takes us in hand for the day, and drives us over the Galata Bridge, in the middle of which they erected a Haman's gallows, in order that the Armenians may hang in sight of the whole city, and so on to St. Sophia, from the square in front of which the blood of the slaughtered Armenians was even then crying out. Church mosques we are not fond of, but this is certainly very fine, with pillars brought from the Temples at Jerusalem, Ephesus, and, we believe, Palmyra. We were more interested in the one remaining cross in it, and the bloody hand on one of the pillars, the mark of the Sultan's hand as he stood triumphant on the piled up bodies of women and children. Mosque after mosque followed, much of a muchness, and after a meal of kibobs and a turn in the bazaars, we got out of the city into the surrounding country. We returned by the Yildiz Kiosk and the New Seraglio, and were accompanied for some distance by a young eunuch on a splendid horse, who kept up a smiling conversation in an unknown tongue. The Sultan's second son then drove by, a nice-looking young fellow, evidently scared to death.

Our friends went for a sail up the Bosphorus, but with snow on the ground and a bitter wind there was but little pleasure in it; so we took the rest of the stay here easily, and were thankful when the whistle blew and we knew that we had left the place for good. Even at the last, the sentry at the Arsenal gate took one of us for a Turk, and blocked the exit.

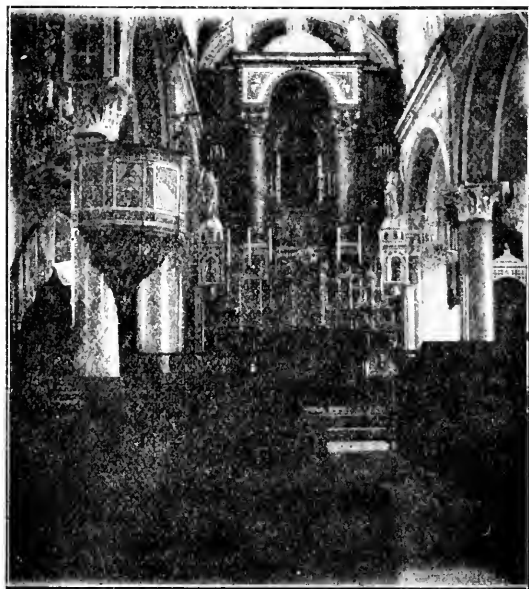
The entrance to Smyrna, our next port of call, is very pleasant, and so was our stay there. There is a tradition that any one drinking the water there must return before they die. So think we. After a hasty dinner, we went on shore, to receive a hearty welcome at the different clubs peculiar to Smyrna.

An early train next day landed us at Ayasalook; here we are at ancient Ephesus. The day was pleasantly spent wandering round the ruined city, but a dreadfully fatiguing day it was, under a broiling sun. The Temple of Diana, the amphitheatre where Paul fought the wild beasts; Luke's tomb in perfect preservation, the School of one Tyrannus, where Paul preached for three years, the ancient Church of the Ephesians, the Magnesian Gate, and the Cave of the Seven Sleepers are all pointed out. The newly-discovered font, in which St. John baptized, is deeply interesting; but we were so dead beat by the time we reached it, that we could hardly do it justice.

The foundations of the ancient church of Smyrna are covered with a newer one, where they show the bones of the martyr Polycarp. The rest of the day we spent in friendly intercourse with Armenians and in visiting the bazaars.

Leaving Smyrna, we next day get close at hand splendid views of Patmos. The famous grotto is, however, on the outer side of the island. Night comes on, and no more land appears until we wake in a morning or two, and there is Jaffa smiling at us in the distance—our first sight of the Holy Land.

We land with great difficulty, and only waiting to see Peter's House, take train up to Jerusalem, through a country interesting in the extreme, and by four o'clock are behind a splendid pair of greys swinging down the road from the railway station to the Jaffa Gate, passing by the Lower Pool



THE CHURCH, WITH THE MARTYR POLYCARP'S BONES OVER THE ALTAR, AT SMYRNA.

of Gihon, and being put down at the Grand New Hotel, certainly the best there is in Jerusalem. It is situated over the pool known as Bathsheba's. A glorious view is obtainable from the flat roof of this hotel, the manager of which is a Manchester man.

Walking out of doors after dark in Jerusalem is still highly dangerous, so the first evening was spent in examining curios, after we had watched the sun set and the shadows deepen, and our long-looked-for first sight of Jerusalem and the Mount of Olives disappear from all but memory. And though the smells, and heat, and stones, and everlasting banging of a cannon sadly upset the meditations we had quite intended to indulge in, we were yet pleased and astonished to find on our return that the events of every moment of our stay had become deeply engraved in our minds, and still remain as our most cherished recollections.

Early the first morning we started, accompanied by dragoman, consulate official and soldier, to see what we could see. Passing through a tunnel, the Temple enclosure lies before you; no gates, no guards—but woe betide the man who ventures on a Mohammedan sacred precinct without permission. The penalty until the Crimean war was death.

The Dome of the Rock attracted our attention first. It stands on an elevated platform, and passing in, you see the Rock summit quite bare, although surrounded by the railing put up by the Crusaders. It is chiselled in parts, and is believed to have been the foundation of the Great Altar of Burnt Offerings. There are some beautifully carved columns in one wall of the mosque, said to be the original ones erected by Solomon. It is rumoured that in the great chambers underlying the Mosque of El Aksa the



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THE DOME OF THE ROCK.

× Is a part of the rock, the rest in the left hand direction is in shadow.

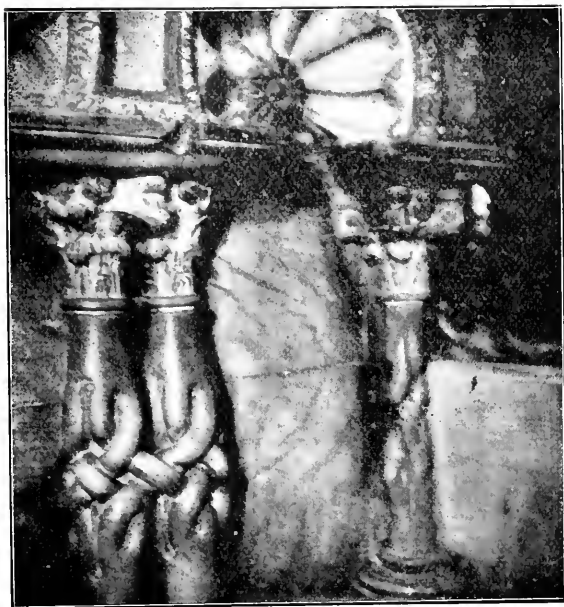
original brass lavers and other instruments are still preserved, but we could obtain no certain information. Secret access is said to have been obtained to them some four years ago. It is also said that the Sulfan has already issued a firman to the Jews, granting permission for the erection of a synagogue or temple in the northern portion of the Temple enclosure.

The great subterranean vaults, known as Solomon's Stables, are very fine with their vaulted aisles; but of far greater interest is the little cave under the rock, in which Araunah and his sons are believed to have hid when the destroying angel appeared over Jerusalem. This little cave seems very real still.

The porch of the Golden Gate is now bricked up, as well as the gate itself, so but little can be seen of it. The whole enclosure is studded with

enclosed wells, in which there is enough water for the whole of Jerusalem, if they were but permitted to drink it. As it is, you eye the discoloured water in the Pool of Hezekiah, near the Jaffa Gate, with the gravest suspicion when you come to see it, and go away with a thoughtful brow.

Passing on, we make our way to the wailing place of the Jews, place our nail in the wall between the stones, pick an untimely fig from the fig-tree in the garden near Wilson's arch at the north-west end of the enclosure, and with a kindly word or two to the Jews assembled, retrace our steps until we pause in front of the Church of the Holy Sepulchre. We now believe in the Skull Rock as being by far the more probable site of Calvary, and the entombment and resurrection; but we had not come to this conclusion then, and entered



THE DOUBLE TWISTED COLUMN.

(Said to be the only remains of Solomon's Temple in Mosque of Omar.)

the church with great awe and reverence. Even now we recall the feeling that came over us as we entered the small central enclosure, and knelt in the presence of that spot which to so many millions is the most sacred spot on earth. We then were taken to the spot which is said to have been the place of crucifixion, and descended into the passage beneath. Fortunately the grating was open, and so we were able to thoroughly examine the so-called rent in the rock leading from the summit of Calvary to the tomb of Adam below. This is interesting, but requires proof.

The next day we passed along the Sorrowful Way, and visited the Cenaculum. These may or may not be the real places, but our thoughts and emotions by now had obtained the upper hand of our critical faculties, and we were glad to take them as they were. The Tower of David opposite

our bedroom window, the new-found Pool of Bethesda, and the pool of Siloam, with a thousand and one other interesting places, passed in succession before our eyes, the first-named place being said to be the palace where the Christ was set at naught by Herod and his men of war.

We carefully examined the much-talked-of walls and gateway at the back of the Church of the Holy Sepulchre, but came to the conclusion that they are but portions of a private mansion, and that the church is really within the old city after all, and not without the gate.

Passing around the city walls we cross the Kedron, which is now confined within narrow stone embankments and could be passed without notice, and spend a little time in the Garden of Gethsemane. We climb the hill, and ascend the tower, and look long and earnestly at all the features of the landscape. We return to the Valley of the Kedron, and examine the



THE RENT IN THE ROCK UNDER THE CHURCH OF THE HOLY SEPULCHRE.

Fountain of the Virgin, and much regret that we had had no time to obtain permission from the Palestine Exploration Society to see their excavations. A wonderful rock passage has been discovered by their agents, and upon being cleared out was found to lead from a remote corner of the Fount backwards and upwards through the solid rock into a chamber well within the ancient citadel wall. This is believed to be the gutter by which Joab and his comrades obtained possession of the citadel of Jebus, probably with the assistance of Araunah from the interior, who, doubtless, retained his life and property as his reward.

We next passed to the north of the city to see the Skull Hill, which we now believe to be the true Golgotha. The outline of the skull and face is truly remarkable, and the position just what one would have expected. The tomb in the perpendicular face of the hill at least answers to the descrip-

tion in the Evangel, and may be the very scene of the victory over death by our Redeemer.

Then we plunged into the Grotto of Jeremiah, but the smells here were sufficient without crossing the road and exploring the quarries on the other side, and with a peep at the Tomb of the Kings (so called) we returned to the city, and went to see the Arch of the "Eccc Homo."

This arch in its simple severity seems to be standing immovable, as an awful witness to the cry it once heard, which sealed the doom of the Jewish nation. Nothing struck us more forcibly than this arch. The cries seem echoing round it still. Under the church in which it stands one finds the Gabbatha or Pavement still preserved, with the soldiers' marks on it still visible, possibly the very spot on which our Lord and Saviour stood on that memorable day.

Wandering over Olivet, and rambling round the walls, with excursions to Bethlehem, Bethany, and the Pools of Solomon, made the remaining time pass only too quickly. Three happy days, and these we liked best of any, were spent at Jericho, at the delightful Jordan Hotel. Dabbling in the Dead Sea, rowing up the Jordan, and climbing over the hillocks of ancient Jericho occupied our time, whilst we were surrounded with every kind of flower, and heard the murmuring rills from Elisha's Fountain, and oh, such oranges! Sad indeed were our faces as we turned away from that happy little corner of the world.

We drove back from Jerusalem to Jaffa, lunching at a little Jewish hotel on the way, crossing the Vale of Ajalon by moonlight and spending the night at Ramleh. Kirjath-Jearim is as it always was, we imagine, and one can fancy all Israel gathered there, and David going up that hill to receive the ark. The battle scene between David and Goliath is passed, and at last the Vale of Sharon bursts on our view far below, and beautiful indeed it is. We reach it through some pleasant wooded declivities, and another hour or two brings us to our boat.

Fortunately the weather remained fine, and we soon reached Alexandria. Save the newly-discovered Serapeum, there is nothing new to see, and the train lands us in Cairo, dear Cairo, by nightfall.

How can we, in a few words, describe the delights of Cairo? Exquisite hotels, pleasant company, and a pleasant land. English food and a French cook, and plenty to see. An English girl dying at Ramleh would insist on being brought to Cairo to die. We can quite understand it.

We, of course, went to see the famous mummies of Pharaoh the Oppressor and his daughter. We even managed to shake hands with the mighty Pharaoh, and stroke his face, and obtain some of the hair and some lotus flowers from one of the queens of old. Another day was spent at the Pyramids and the Desert, and another at Sakharah, wandering over ancient Memphis, visiting our friends the colossal statues of Ramses, whom the husband of one of our relations had had the pleasure of raising from the mud and housing, if not clothing, and enjoying, above all, the glorious ride through the desert, the air like champagne, and all care left behind. So different to one's idea of desert life. Surely some of the old life must still hang over the plains of Memphis.

The outer stones of the pyramids, by the way, are mathematically exact to the fiftieth of an inch, and must have been carved with hollow drills set with precious stones, the sixteen-ton block and the tool being rotated in different directions. Workmen, indeed, they were, who need not to be ashamed.

All things come to an end; even Cairo; and, with farewells to the North Staffordshire and Lancashire men proceeding to the front, we leave this happy land and steer for Naples. Here we leave the yacht—fortunately for us, as our friends barely reached Marseilles, and even then one died, a most desperate gale being encountered when but twelve hours from France—and make our way by slow degrees, with stays of a few days each at Rome, Florence, and the different towns of the Riviera, back to England, home, and beauty; and what beauty—smoke, and rain, and chill. And yet, after all, it is England—England which we dreamed of even midst the beauties of Ceylon—England in which you sit by your fireside and dream it all over and over again, and the memories grow all the more fragrant as the things that have been pass into the distant past.

Monsignor GADD moved a vote of thanks to Mrs. Oram for her address. The motion was seconded by Mr. C. H. BELLAMY, supported by Mr. SCOTT, and carried. Mrs. ORAM responded, and Dr. ORAM gave further explanations in reply to questions.



ST. JOHN'S CHURCH, DEANSGATE.

The 406th Meeting was held in the Library, on Monday, October 26th, 1896, at 7-30 p.m. Mr. C. H. BELLAMY, F.R.G.S., in the chair.

The minutes of the 405th Meeting were read and approved.

The Rev. J. HENN, B.A. (Rector of Heaton Chapel, and formerly Rector of St. John's, Deansgate), addressed the Society on "An Old Manchester Parish." The address was illustrated with old deeds; a petition to Parliament, which was not presented; old registers, signed by



Yours very faithfully
Richard Hanby

(Formerly connected with St. John's Church, and later the Master of the Chetham Hospital.)

the first rector, the Rev. John Clowes; photographs, drawings, and old relics, some of them lent by the present rector, the Rev. F. B. Leech. The late Richard Hanby was referred to, and his work in connection with St. John's and with Chetham's Hospital was spoken of with great appreciation.

The Rev. S. A. STEINTHAL moved a hearty vote of thanks to Mr. Henn for his address, and also to Mr. Leech. Mr. H. J. CROOK seconded, and Mr. J. D. WILDE supported the resolution. Mr. HENN responded.

The 407th Meeting was held at the Whitworth Institute, Whitworth Park, on Saturday, November 7th, 1896, at 3 p.m. Mr. S. OPPENHEIM in the chair.

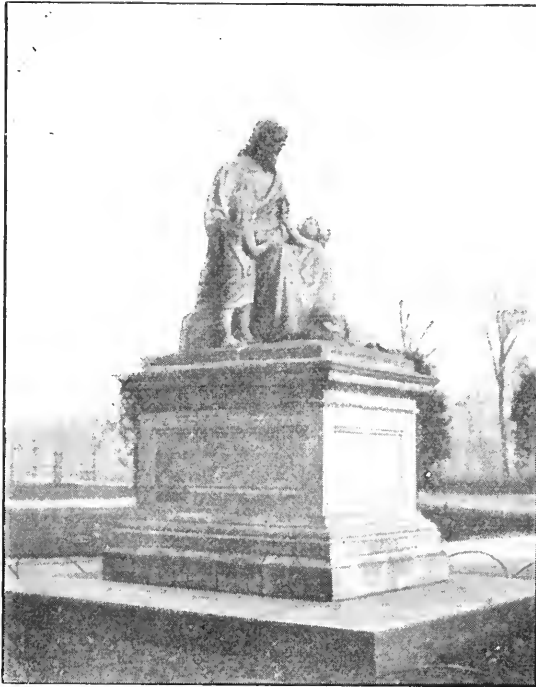
A letter of apology from Mr. R. D. Darbishire for not being able to receive the members, was read; and, in his absence, the SECRETARY



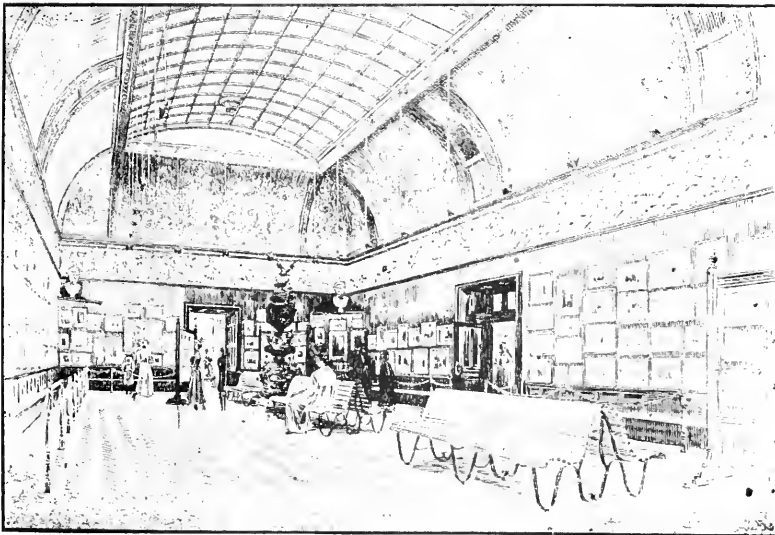
THE MUSEUM IN WHITWORTH PARK,
(The new part is seen on the left hand.)

addressed the members on "The Whitworth Institute: Its Origin and History" (see page 314), referring to the numerous gifts of the Whitworth Trustees to the city.

The members remained in the galleries for a considerable time, and thanks were tendered to the Curator for his kind assistance.



STATUE OF CHRIST AND THE CHILDREN.
(By Tinworth. Designed and presented by Mr. R. D. Darbishire. In Whitworth Park.)



VIEW OF ONE OF THE NEW GALLERIES.
(By permission of the Architect, Mr. J. W. Beaumont, F.R.I., B.A.)

The 408th Meeting was held in the Library, on Monday, November 9th, 1896, at 7-30 p.m. Mr. ELI SOWERBUTTS, F.R.G.S., in the chair.

The minutes of Meetings 406 and 407 were read and approved.

The election of the following members was announced:—

ORDINARY: Messrs. Alfred Bridge, George Holland, William Holland, Junr., Walter Illingworth, E. Law, Richard Maginnis, L. M. Simonsen; Councillor Sinclair, M.D.

The SECRETARY made some observations on the work of the Lancashire and Cheshire Union of Institutes, and Mr. J. D. WILDE, M.A., gave an account of the Annual Meeting of the Yorkshire Union, and described the excursion made by the delegates from Cleckheaton through the country associated with the Brontë family.

Thanks were tendered to Mr. Wilde for his address.

The 409th Meeting was held at the Art Museum, Ancoats, on Tuesday, November 17th, 1896, at 6 p.m.

Mr. GEORGE MILNER, J.P., received the members and gave an address on "The Establishment of the Museum, and the Aims of its Promoters," and Miss STOEHR explained the object and scope of the University Settlement.

Some members of the Museum Committee assisted Mr. T. C. Horsfall, J.P., to conduct the members through the Museum. Mr. and Mrs. D. A. Little very kindly provided light refreshments.

The Chevalier FROELICH moved a vote of thanks to Mr. Milner, Miss Stoehr, and Mr. Horsfall. Mr. MILNER responded. Thanks were tendered to Mr. and Mrs. Little for their hospitality, on the motion of Mr. SNADDON, seconded by Mr. CHIVERS.

The 410th Meeting was held in the Library, on Monday, November 23rd, 1896, at 7-30 p.m. The Chevalier FROELICH in the chair.

The minutes of Meetings 408 and 409 were read and approved.

The election of the following members was announced:—

ORDINARY: Captain James Yule Deeley, Mr. Thomas W. Handley.

The Rev. J. S. DOXEY addressed the members on "Kashmir." Lantern views, maps, pictures, and photographs of buildings and people were exhibited, and a beautiful illuminated prayer-roll, about three inches wide and twenty-four inches long, was examined with much interest. The words were written in small characters, illuminated in gold and colours. Knives, daggers, scissors, and ornaments of Kashmirian make, and a very old book composed of birch-bark leaves were displayed.

Questions were asked, and Mr. J. HOWARD REED moved a vote of thanks to Mr. Doxey. The CHAIRMAN also spoke, and Mr. DOXEY replied.

The 411th Meeting was held in the Library, on Friday, December 4th, 1896, at 7-30 p.m. Professor T. H. CORE, M.A., in the chair.

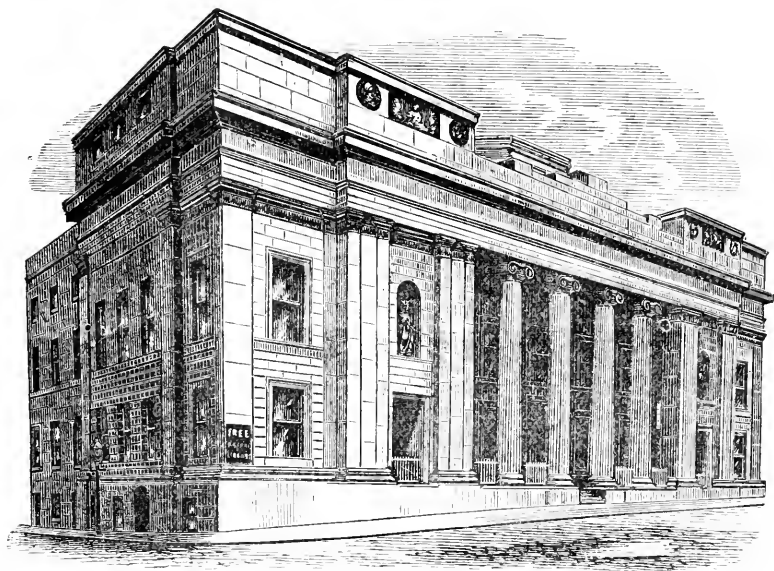
Mr. CLEMENT WRAGGE, F.R.Met.Soc., etc., the distinguished Queensland Meteorologist, addressed the Society on "The Meteorology of Australasia" (see page 189), and illustrated his address with maps, diagrams, and lantern slides. Mr. Wragge has a world-wide reputation as a meteorologist. He has travelled over large parts of Australia, Tasmania, and the Pacific Islands, and has done magnificent scientific work in relation to the establishment of Meteorological Stations in the Southern lands, connecting those stations with India and America. The address was a very valuable one, and was listened to with great attention.

Many questions were asked, and replied to by Mr. WRAGGE.

Mr. C. BELLAMY, F.R.G.S., moved a hearty vote of thanks to Mr. Wragge for his address; this was seconded by Mr. SPENCER, and carried unanimously.

The members then spent some time in examining the diagrams. The valuable set of Meteorological observations sent by Mr. Wragge from Brisbane to the Society were also carefully examined, and pleasure was expressed by many of the members at the results of the observations.

The 412th Meeting was held at the Free Reference Library, King Street, on Saturday, December 5th, 1896, at 3 p.m.



REFERENCE LIBRARY, KING STREET.
(Formerly the Town Hall.)

Mr. C. W. SUTTON (the Chief Librarian of the Manchester Corporation) described the work and difficulties at King Street and at the branch libraries. He exhibited a large, interesting, and valuable collection of geographical works, which had been added to the library since the previous visit of the Society (*Journal*, Vol. IV., pages 113-120), and described the method of classification now being adopted.

MESSRS. DOWDALL, BELISHA, JACKSON, and others, expressed the thanks of the members to Mr. Sutton for his kind attention. Mr. SUTTON responded, and expressed the pleasure it always gave him to receive societies and explain to them the work of the libraries.

The 413th Meeting was held in the City Art Gallery, Mosley Street, on Tuesday, December 8th, 1896, at 7 p.m. Alderman I. BOWES in the chair.

Mr. Councillor J. E. PHYTHIAN (Chairman of the Art Gallery Committee) received the members and addressed them on "The Work of the Committee." He pointed out that there had been a certain amount of overlapping by the various institutions of the city, as the Whitworth Institute, the School of Art, Technical School, Queen's Park Museum, Ancoats Art Museum, and announced that they were working to the operations of the various bodies.

Mr. BOWES moved a hearty vote of thanks to Mr. Phythian for his reception, and Mr. J. THOMPSON seconded. Mr. PHYTHIAN responded, and invited the members to the new tea-room, where light refreshments were served. The rest of the evening was spent in inspecting the loan and permanent collections.

The 414th Meeting of the Society was held in the Library, Wednesday, December 16th, 1896, at 7-30. In the chair, Mr. C. H. STOTT.

Mr. BEN MULLEN, M.A. (Dub.), F.R.A., the Curator of the Salford Museum, addressed the Society "On some of the Manners and Customs of Native Races."

This very interesting address was illustrated with a large number of lantern slides of native objects, a large number of the objects shown on the screen being taken from those in the Salford Museum, which Mr. Mullen had been re-arranging.

Very hearty thanks were given to Mr. Mullen for his address, after which further reference was made to the Earthquake in Iceland this year, and to Mr. Newby's very interesting paper thereon. (See page 174).

The 415th Meeting of the Society was held in the Library, Monday, December 21st, 1896, at 7-30 p.m. Mr. J. D. WILDE in the chair.

The minutes of previous meetings were read and approved.

The SECRETARY gave an account of the Meeting of the British Association at Liverpool, and mentioned the various ways in which some members of the Society were aiding scientific work in connection with the Committees of the Association, and asked for an addition to these voluntary workers. The Secretary described the various meetings, mentioning the magnificent hospitality of the Liverpool people, which was interfered with by the very persistent bad weather. But the meetings of the section were full of interest. One of the most interesting papers read was by Mr. Lyster, the Liverpool Engineer, on "The Estuary of the Mersey."

The delegate attended the meetings of the delegates, but both meetings were utterly devoid of any interest, and were not of any great value.

The next meeting of the Association will be held in Toronto in 1897. A considerable number of the members expressed their intention of being present at that meeting.

The Hand-books issued to the members were most valuable. The Report was illustrated by a number of maps and lantern views of Liverpool, and by a picture representing Liverpool in 1857.

The Report was adopted, and the delegate was thanked for his services.

During the evening Mr. Wilde and his friends gave selections of music, which were much enjoyed and appreciated.

Light refreshments were served in the members' room.

The meeting was thoroughly enjoyed by those present, and closed late, thanks being given to the musicians and the attendants.

The 416th Meeting of the Society was held in the Library, Tuesday, December 22nd, 1896. In the chair, Mr. J. D. WILDE.

Miss EDITH WILKINSON gave the children assembled for this lecture a geographical lesson of a novel kind, which was as delightful as it was surprising. Mr. W. Mather, J.P., had very kindly sent some coloured moulding sand of various colours, and, with a quantity of natural sand, Miss Wilkinson built up a model of Harlech Castle and the sea coast; then she moulded a sand map of France and of other countries. She was very keenly watched by the children, who, with their elders, were very much interested.

When the demonstration was concluded, very warm thanks were tendered to Miss Wilkinson for her kindness in coming to give this novel and interesting address, and the children crowded round the table to beg for sand to make small sand heaps at home.



A GROUP OF THE MEMBERS AT SADDLEWORTH WITH MR. MORGAN BRIERLEY.
(See page 289.)

LIST OF MEMBERS,

December 31st, 1896.

Note.—H signifies Honorary, C—Corresponding, L—Life, A—Associate, * Affiliated Societies. All others are Ordinary Members.

- | | |
|-----------------------------------------|-----------------------------------------|
| Adam, Sir Frank Forbes, C.I.E. | Blake, George Ingle |
| L Ainsworth, John (Machakos, Ibea). | ABlake, Henry Neville |
| Aldred, Wm., F.C.A. | Blake, John Charles, F.R.G.S., |
| Alexander, Bernard | F.I.Inst. |
| Alexander, W. T. | Blake, P. C. D., M.A. |
| Allen, C. H., F.R.G.S. | ABleloch, W. |
| Anson, The Ven. Archdeacon | Bles, A. J. S. |
| Armistead, Richard | Boardman, James, F.C.A. |
| Armitage, Benjamin, J.P. (Chomlea). | LBoddington, Henry, J.P. |
| Armitage, Sam. | Bodington, Professor N., Litt.D., Vice- |
| Armitage, Alderman, V. K., M.A., J.P. | Chancellor of Victoria University |
| Arning, Charles E. | cBodio, Professor Luigi, Rome. |
| Arnold, W. A. | Boiadjieff, K. N. |
| Aron, Ludwig | Bolton, H. Hargreaves |
| Ascoli, E. | HBouaparte, Prince Roland, Paris |
| Ashworth, Miss A. | Booth, James, J.P. |
| Ashworth, Francis | Booth, Samuel |
| Ashworth, F. D. | ABooth, William |
| | Booth, W. G., L.R.C.P.S. |
| Baddeley, John, J.P. | ABosworth, George R. |
| Bailey, Alderman Sir W. H., J.P. | ABottomley, J. Alfred |
| Balfour, The Right Hon. A. J., M.P. | ABottomley, Wm. |
| Ballantine, Major R. F. | Bowes, George T. |
| ABalmer, A. W. | Bowes, Alderman Isaac |
| Balmer, J. E., F.R.G.S. | ABowker, A. W. |
| Bardsley, G. W. | Braddon, Councillor C. H., M.D., J.P. |
| Barker, James | Bradley, Councillor William |
| Barker, Reuben C. | Bradshaw, Wm. |
| Barker, Richard | Brammer, G. F. |
| ABarlow, James | Bramwell, Samuel |
| Barlow, John R., J.P. | ABramwell, Thoma- |
| Barrington, Joseph | Brashaw, A. H. |
| Bater, Rev. A. B. | Brettaner, L. |
| Bates, Alderman Ralph, J.P. | Bridge, Alfred |
| ABatho, Thomas | Brier, Charles |
| Beer, Walter | ABrierley, R. E., B.A. |
| Behrens, Charles | Bright, The Right Hon. Jacob |
| Behrens, Gustav, J.P. | Brooks, Councillor S. H., F.I.Inst. |
| Behrens, Henry | Broome, Joseph, J.P. |
| Behrens, Oliver P. | cBrower, Hon. J. V., St. Paul, Minn., |
| Beith, Gilbert | U.S.A. |
| nBelgians, His Majesty the King of the, | Brownrigg, W. F. |
| K.G. | Brown, John H. |
| ABelisha, B. I. | Brown, R. Hope, Bolton |
| Bellamy, C. H., F.R.G.S. | cBryce, J. Aunan |
| Bennie, Andrew | Bubier, Louis |
| Berry, Harold | Buchanan, Captain |
| Berry, Councillor Joseph | ABuckley, B., J.P. |
| Berthoud, H. L. | Buckley, W. H. |
| ABessant, W. S. | Burgon, Anthony |
| ABickerton, Richard | *Burnley Literary and Scientific Club |
| Billington, J. A. | LBurton, Frederic |
| Birley, Thomas Hornby | Butler, E. |
| Black, Surgeon-Major W. G., F.R.C.S.E. | Butter, F. A. |
| Blackburn, James | Bythell, J. K., J.P. |

ACadman, Wm.
 ACaldwell, Wm.
 Calvert, D. R.
 Cambell, E. H.
 Campion, G. G.
 ACardwell, J. J.
 *Carile Institute, Meltham
 Casartelli, Very Rev. L. C., M.A., Ph.D.,
 Rector of St. Bede's College
 cCasati, Captain G.
 Cawley, Frederick, M.P.
 Chadwick, John, J.P.
 AChadwick, Thomas
 Chatwood, S., F.R.G.S.
 Cheetham, J. F., J.P., F.I.Inst.
 Cheetham, James
 ACheetham, Walter
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THE
MANCHESTER GEOGRAPHICAL SOCIETY.

RULES.

I. OBJECT AND WORK.

The object of the Manchester Geographical Society is to promote the study of all branches of Geographical Science, especially in its relations to commerce and civilisation.

The work of the Society shall be:—

1. To further in every way the pursuit of the science; as, by the study of official and scientific documents, by communications with learned, industrial and commercial societies, by correspondence with consuls, men of science, explorers, missionaries, and travellers, and by the encouragement of the teaching of geography in schools and colleges.

2. To hold meetings at which papers shall be read, or lectures delivered by members or others.

3. To examine the possibility of opening new markets to commerce and to collect information as to the number, character, needs, natural products and resources of such populations as have not yet been brought into relation with British commerce and industry.

4. To promote and encourage, in such way as may be found expedient, either alone or in conjunction with other Societies, the exploration of the less known regions of the earth.

5. To inquire into all questions relating to British and Foreign colonisation and emigration.

6. To publish a Journal of the proceedings of the Society, with a summary of geographical information.

7. To form a collection of maps, charts, geographical works of reference, and specimens of raw materials and commercial products.

8. The Society shall not enter into any financial transactions beyond those necessarily attached to its declared object, and shall not make any dividend, gift, division, or bonus in money unto or between any of its members.

II. ORGANISATION.

9. The Society shall consist of ordinary, associate, corresponding, and honorary members.

10. A Council shall be chosen annually from the ordinary members to conduct the affairs of the Society. It shall consist of a President, four or more Vice-Presidents, a Treasurer, two or more Honorary Secretaries (including a Secretary for Foreign Correspondence), and twenty-one Councillors.

11. There shall be three Trustees elected by the Society, who shall hold office until death, disability, insolvency, or resignation. They shall be members of the Council by virtue of their office.

12. Any vacancy occurring in the Council during the current year may be filled up by the Council.

III. ELECTION OF MEMBERS.

13. Every candidate for admission into the Society as an ordinary or an associate member must be proposed by a member. The proposal shall be read out at the next Ordinary Meeting of the members, and any objection shall be forwarded in writing to the Secretary within seven days.

14. The election of members is entrusted to the Council. The names of those elected shall be announced from the chair at the next Ordinary Meeting after the election.

15. The Secretary shall within three days forward to every newly-elected member notice of his election, a copy of the Rules of the Society, and a card announcing the days on which the Ordinary Meetings will be held during the session. But the election of an ordinary or associate member shall not be complete, nor shall he be permitted to enjoy the privileges of a member, until he shall have paid his first year's subscription. Unless such payment be made within three calendar months from the date of election the election shall be void.

16. The Council shall have power to elect honorary and corresponding members.

17. Women shall be eligible as members and officers of the Society.

IV. PAYMENTS.

18. Any ordinary member shall pay an annual subscription of £1 1s., or he may compound by one payment of £10 10s. An associate member shall pay an annual subscription of 10s. 6d. The Society's year shall begin on the first day of January.

19. Members shall not be entitled to vote or to enjoy any other privilege of the Society so long as their payment shall continue in arrear, but associate members shall not vote nor shall they take any part in the government of the Society.

20. The first annual payment of a member elected in November or December shall cover his subscription to the 31st December in the year following.

21. On the first day of January in each year there shall be put up in the rooms of the Society a complete list of the members with the amount of their subscription due, and as the amounts are paid the fact shall be marked on the list.

22. Notice shall be sent to every member whose subscription shall not have been paid by the first of February, and if the arrears are not discharged by the first of July the Council may remove the member from the list of members. Any member, whose subscription is in arrear for two years shall not be entitled to receive the Journal of the Society.

V. MEETINGS.

23. The meetings of the Society shall be of three kinds—Ordinary, Annual, and Special.

24. In all meetings a majority of those present shall decide all questions, the President or Chairman having a casting vote in addition to his own.

ORDINARY MEETINGS.

25. The Ordinary Meetings of the Society shall be held once a month, from the month of October to the month of May, or oftener, if judged expedient by the Council.

26. All members whose subscriptions are not in arrear shall have a right to be present. All ordinary members shall have the privilege of introducing one visitor.

27. The order of proceedings shall be as follows:—

- (a) The minutes of the last meeting to be read and if correctly recorded they shall be signed by the Chairman.
- (b) Presents, whether of money, books, maps, charts, instruments or specimens made to the Society to be announced.
- (c) The election of new members to be declared and the names of candidates to be read.
- (d) Papers and communications to be read and discussed.

28. At these meetings nothing relating to the rules or management shall be brought forward, but the minute book of the Council shall be on the table at each meeting for the inspection of any member, and extracts therefrom may, with the consent of the chairman, be read to the meeting on the requisition of any member.

29. On occasions of exceptional interest the Council may make provision for a larger admission of visitors.

ANNUAL MEETINGS.

30. The Annual Meeting of the members shall be held at such time and place as the Council shall determine.

31. Fourteen days' notice of such meeting shall be sent to every member within the United Kingdom who has given his address to the Secretary, and notice of the meeting shall be advertised in such newspapers as the Council may direct.

32. The object of this meeting shall be to receive the Annual Report of the Council and the Treasurer's Balance Sheet, to hear the President's address, to elect the Council and officers for the ensuing year, and to transact any other business.

33. Any two ordinary members may nominate candidates for the Council or for office not later than one week prior to the day of election, and the names of candidates so nominated shall be at once put up in the rooms of the Society. The election of the Council and officers shall be by ballot.

SPECIAL GENERAL MEETINGS.

34. The Council may call a Special General Meeting of the Society whenever they shall consider it necessary, and they shall do so if required by 20 ordinary members.

35. A week's notice of the time and object of every Special Meeting shall be sent to all members. No other business shall be entertained than that of which notice has been thus given.

36. Twenty ordinary members shall form a quorum.

VI.—COUNCIL AND OFFICERS.

THE COUNCIL.

37. The government of the Society shall be entrusted to the Council, subject to the rules of the Society.

38. The Council shall annually elect a Chairman and Vice-Chairman.

39. The President or the Chairman, or any three members of the Council, may at any time call a meeting thereof, to which every member of the Council shall be summoned.

40. Seven shall form a quorum.

41. In order to secure the most efficient study and treatment of the various subjects which constitute the chief work of the Society, the Council may appoint Committees for special purposes. These Committees, with the approbation of the Council, may associate with themselves any persons—whether members of the Society or not—from whom they may desire to obtain special assistance or information. The Committees shall report to the Council the results of their proceedings.

42. The President, Chairman, Vice-Chairman of the Council, and the Honorary Secretaries, shall, by virtue of their offices, be members of all Committees appointed by the Council.

PRESIDENT AND VICE-PRESIDENTS.

43. The President is, by virtue of his office, the chairman of all the meetings of the Society. In the absence of the President, one of the Vice-Presidents may preside.

CHAIRMAN OF THE COUNCIL.

44. It is the duty of the Chairman of the Council to see that the rules are properly observed, to call for reports and accounts from Committees and Officers, and to summon, when necessary, special meetings of the Council and of Committees.

TREASURER.

45. The Treasurer has the charge of all accounts; he shall pay all accounts due by the Society after they have been examined and approved by the Council.

46. He shall see that all moneys due to the Society are collected, and shall have power, with the approval of the Council, to appoint a collector. All moneys received shall be immediately paid to the bankers of the Society.

47. The bank passbook and the book of accounts shall be laid upon the table at every ordinary meeting of the Council.

48. The accounts shall be audited annually by two members, who shall be elected at an ordinary meeting at least one month before the Annual Meeting.

SECRETARIES.

49. The duty of the Honorary Secretaries shall be :—

- (a) To conduct the correspondence of the Society and of the Council.
- (b) To attend the meetings of the members and of the Council, and minute their proceedings.
- (c) At the ordinary meetings, to announce gifts presented to the Society since their last meeting; to read the names of all new members and of candidates for admission, and the papers communicated to the Society, which have been directed by the Council to be read.
- (d) To have immediate superintendence of all persons employed, to make arrangements for the meetings of the Society, and to take charge of all maps, books, furniture and other effects.

50. It shall be the more especial duty of one of the Honorary Secretaries to conduct, as may be directed by the Council, correspondence with Foreign Societies, and with persons resident abroad.

51. In addition to the Honorary Secretaries, there shall be a paid Secretary appointed by the Council, whose duties shall be to assist the Honorary Secretaries, to issue the notices of the Council and of the Society, and to act under the instructions of the Council.

The foregoing Rules, as now amended, were approved and adopted at a meeting of the members of the Society, of which due notice had been given to the members, held in the Town Hall, Manchester, Wednesday, October 3rd, 1894.

(Signed) GEORGE, *President.*
 S. ALFRED STEINTHAL, *Chairman.*
 F. ZIMMERN, *Honorary Secretary.*
 JAS. D. WILDE, M.A., *Honorary Secretary.*
 ELI SOWERBUTTS, *Secretary.*

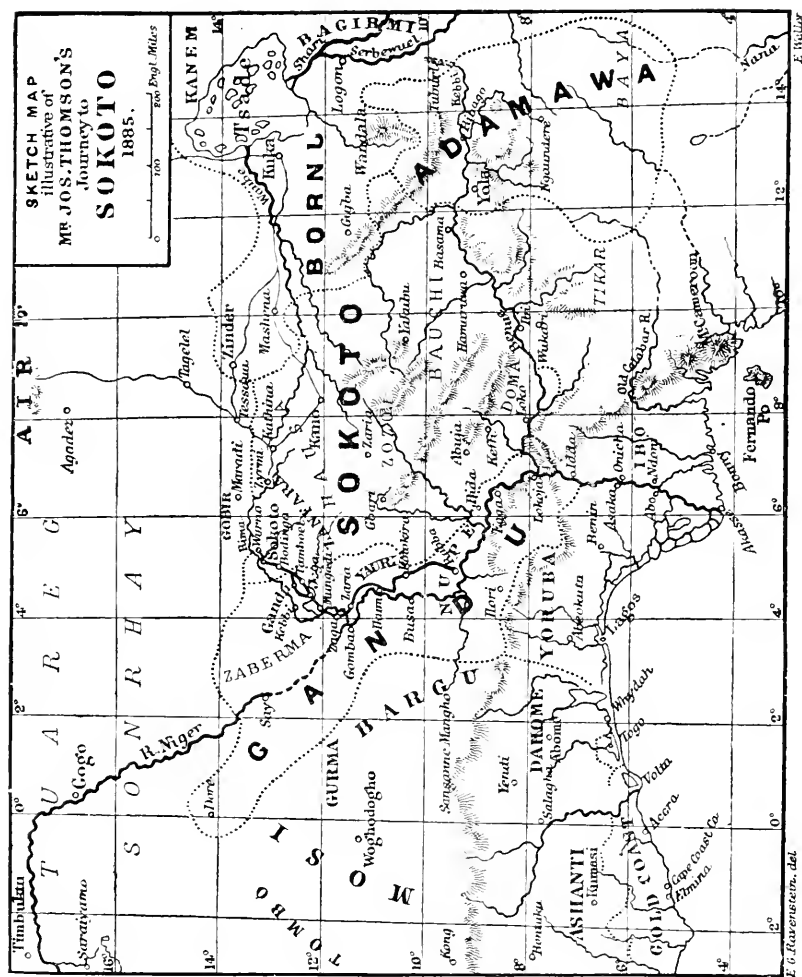
[COPY.]

It is hereby certified that this Society is entitled to the benefit of the Act 6 and 7 Vict., Cap. 36, intituled "An Act to exempt from County, Borough, Parochial, and other Local Rates, Lands and Buildings occupied by Scientific or Literary Societies."

Seal of Registry of
Friendly Societies.

This 15th day of January, 1895.

E. W. B.



SOKOTO AND PART OF THE NIGER TERRITORY.

This Sketch Map, prepared under the direction of the late Mr. J. Thomson, F.R.G.S., in 1885, is reproduced because at the present time it will be of value for reference.

MANCHESTER GEOGRAPHICAL SOCIETY.

VICTORIAN LECTURES.

A body of gentlemen known as the "VICTORIANS," composed of Members of the Council and other prominent Members of the Society, all Geographical experts, freely *GIVE* their services as Lecturers. This is done with a view of increasing the usefulness of the Society, and to spread reliable Geographical information. The Lectures are given in a popular manner, and are a valuable educational influence in Manchester and the surrounding districts, and are much in demand.

TERMS FOR LECTURES.

The terms upon which these Lectures are delivered are as follows:—

Any Member of the Manchester Geographical Society, or any Affiliated Society, is entitled to make application for "Victorian" Lectures during the Session.

The Lectures must be advertised as by Mr. —, a "Victorian of the Manchester Geographical Society."

The services of the Victorians are *gratuitous*, but to meet the necessary expenses of carrying on the work a small fee for each Lecture is charged, and Railway Fares, Lantern Hire and Carriage, Hire of Slides, and other special expenses, when incurred.

Lectures by the Victorians for others than Members, or Affiliated Societies, can only be given sparingly, and will be charged from £2 2s. for each Lecture, with the addition of travelling and lantern expenses.

Any balance left out of these charges, after paying the expenses incurred, is applied to the repair and upkeep of the lantern, and the making of new slides. The Society's Lantern is NOT lent unless a "Victorian" Demonstrator accompanies it.

Applications for Lectures, or for any information, should be made to the Hon. Secretary "Victorians," at the Offices of the Society, 16, St. Mary's Parsonage.

The "Victorians" will be glad to arrange Lectures, to form a series, for Technical or Continuation Schools.

The "Victorians" offer the following Lectures to the Members and Affiliated Societies:—

- | | |
|----------------------------------------------------------------|-------------------------------------------------------------|
| 1. Physical Geography. D. | 34. A Short Tour through Sweden (Gota-canal). L. |
| 2. The Life and Work of a River. D. L. | 35. Madeira and the Canary Islands. L. |
| 3. The Making of Mountains. D. L. | 36. India: The Geography of the Country. D. L. |
| 3A. Landscape Making. L. | 37. India: The People, their Customs and Manners. L. |
| 4. Elements of Map Projection. D. L. | 38. India: The Antiquities. L. |
| 5. Maps, and how to Read them. D. | 39. Ceylon, "The Pearl of the East." L. |
| 6. Commercial Geography. D. | 40. A Peep at the Land of the Rising Sun. L. |
| 7. The Circle of Geographical Sciences. | 41. Palestine: Old and New. D. L. |
| 8. The Obligation of Geography to Missionaries. D. | 42. The British in South Africa. L. |
| 9. The Battlefields of Europe. D. L. | 43. British Central Africa (Nyasaland). L. |
| 10. A Thousand Years of Hungarian History. L. | 44. British East Africa. L. |
| 11. The Balkan Peninsula. D. | 45. The Uganda Protectorate. D. L. |
| 12. The Mediterranean: A Study in Comparative Geography. D. L. | 46. The Great Lakes of Central Africa. D. L. |
| 13. The Rhine from Source to Sea. L. | 47. The Commercial Products of Central Africa. |
| 14. A Peep into Switzerland. L. | 48. The Congo: Its Discovery and Exploration. D. L. |
| 15. Notes of Journeys through Switzerland. L. | 49. Across Africa with Stanley. L. |
| 16. Naples and Pompeii. L. | 50. The Nile and its Story. D. L. |
| 17. Old and New Rome. D. L. | 51. Egypt and its Monuments. L. |
| 18. A Scamper through Italy. L. | 52. Canada. D. L. |
| 19. A Cruise in Dutch Waters. L. | 53. The Great North-West. D. |
| 20. Manchester: Historical and Geographical. D. L. | 54. Across the Rocky Mountains. L. |
| 21. Oxford: The Colleges and College Life. L. | 55. Chicago, and a Visit to Niagara. L. |
| 22. Westward Ho! L. | 56. From New York to San Francisco. L. |
| 23. West Wales (Devon and Cornwall). L. | 57. Australia: Its Discovery and Exploration. D. L. |
| 24. Dear Old Devon. L. | 58. Australia: The Development and Present Condition. D. L. |
| 25. The Scilly Isles. L. | 59. A Trip to the Antipodes. D. L. |
| 26. Some English Cathedrals. L. | 60. Greenland. D. |
| 27. The Norfolk Broads. L. | 61. Polar Exploration (North and South). L. |
| 28. The Isle of Skye. L. | 62. Recent Attempts to Reach the North Pole. L. |
| 29. The Shetland Isles. L. | 63. Nansen and the North Pole. L. |
| 30. Through Connemara with a Camera. L. | |
| 31. A Tour in Normandy. L. | |
| 32. Venice, Past and Present. L. | |
| 33. Genoa the "Superb." L. | |

A number of other subjects are in preparation; particulars can be obtained from the Hon. Sec. of the Victorians.

The letter L means lantern wanted for slides. The letter D means diagrams or maps are used. It will be observed that some lectures are given with either, as may be required.

LIST OF MAPS, BOOKS, JOURNALS, &c.,

ACQUIRED BY THE SOCIETY FROM JANUARY 1st TO DECEMBER 31st, 1896.

MAPS.

GENERAL.

Charts of the North Atlantic Ocean and the North Sea, showing Surface Temperature, May, August, November, 1893 : February, May, 1894. 5 sheets. Royal Geographical Society, 1896. * The Society.

Charts of the North Sea, showing Surface Salinity, May, August, November, 1893 : February, May, 1894. 5 sheets. Royal Geographical Society, 1896. * The Society.

EUROPE.

Macclesfield District. No. LXXXI. S.W. 1 inch to 1 mile. Engraved and Published at the Ordnance Map Office, London, 1842. Railways to June, 1879.

Macclesfield District. Sheet 110. 1 inch to 1 mile = 1/63,360. Engraved and Published at the Ordnance Survey Office, Southampton, 1887. Railways to October, 1891.

ASIA.

Sketch Map of the Valley of the Upper Euphrates, from Samsat to Sadagh, to illustrate the paper by V. W. Yorke. Scale, 1/500,000. * The Royal Geographical Society.

Central Persia, showing Captain H. B. Vaughan's Routes, in 1889 and 1891. 1/3,000,000, or 48 miles to an inch. Royal Geographical Society, 1895.

The Pamirs and Adjoining Territories of Central Asia and India. Compiled by H. Sharbau, under the direction of the Right Hon. G. N. Curzon, M.P. 1896. Scale, 1/1,000,000, or 1 inch to 15.78 miles. Published by the Royal Geographical Society. * Royal Geographical Society.

The Karakoram Himalayas. Sheet I. : Bagrot, Hunza, Nagyr, and the Hispar Glacier. Sheet II. : The Biafo and Baltoro Glaciers. Surveyed in 1892 by W. M. Conway, and reduced from his drawing. Scale, 1/126,720, or 2 miles to 1 inch. Published by the Royal Geographical Society, 1894.

Sketch Map of the Shan States, to illustrate the paper by Colonel R. G. Woodthorpe, C.B., R.E. Scale, 1/2,000,000, or 1 inch to 31.56 miles. Published by the Royal Geographical Society. * The Society.

The Japanese Alps. Sketch Map, by the Rev. Walter Weston. 1/400,000, or 6.35 miles to 1 inch. Royal Geographical Society, 1896.

AFRICA.

- The Geography of Mammals. Map of the Ethiopian Region, showing its Division into Four Sub-regions. Royal Geographical Society, 1895. * The Society.
- Tripoli. Map of Part of Tarhuna and Gharian. By H. Swainson Cowper. 1895. 1/500,000, or 8 miles to 1 inch. Royal Geographical Society, 1896.
- Carte Topographique de la Région de Tombouctou, dressée par P. Vuillot: d'après les observations, les itinéraires, les reconnaissances, etc., effectuées en 1894 et 1895. Scale, 1/100,000=1.58 miles to 1 inch. Publié sous le patronage de la Société de Géographie de Paris. 1896. * M. P. Vuillot.
- Carte du Transnigérien. Le Bandama et le Bagoé. Levée et dressée par le Capitaine Marchand. In two sheets. 1/500,000. Service Géographique des Colonies, Paris, 1896, avec notice et Index Alphabétique. * Le Ministre des Colonies.
- Carte de la Côte d'Ivoire. 1/150,000. Fresco au Cavalry (8 feuilles). Levée et dressée par H. Pobeguim, Administrateur Colonial. 1895-6. Service Géographique, Ministère des Colonies, Paris. * M. le Ministre des Colonies.
- Map of the Niger Coast Protectorate and Adjacent Territories. Scale, 1/506,880, or 1 inch to 8 miles. Intelligence Division, War Office. No. 1135. * The Director of Military Intelligence.
- Map of the South-Eastern Portion of the Niger Coast Protectorate. Compiled by Captain C. F. Close, R.E., 1895. Scale, 1/506,880, or 1 inch to 8 miles. Intelligence Division, War Office. No. 1194. * The Director of Military Intelligence.
- Sketch Map of the Niger Territory, showing the Routes of the Rev. C. H. Robinson and William Wallace. 1896. * Royal Geographical Society.
- Map of Part of Matabilliland. Compiled and Lithographed, Intelligence Division, War Office, May, 1896. No. 1166. Published, on behalf of the War Office, by E. Stanford. 1/6. * The Director of Military Intelligence.
- Troye's Map of the Transvaal. Scale, 1/500,000. Engraved and printed by Wurster, Randegger, and Co., Winterthur, Switzerland. * Mr. Councillor S. H. Brooks.
- Map to illustrate the operations in East Africa. February and March, 1896. Scale 1/506,880 or 1 inch to 8 miles. (Operations described in Africa. No. 6, 1896.) Intelligence Division, War Office. No. 1173. * The Director of Military Intelligence.
- Map to illustrate the operations of the Unyoro Field Force, under command of Major G. Cunningham, April-June, 1895, and the reconnaissance of the Upper Nile from Lake Albert to Dufile. By Lieut. C. E. Vandeleur. Scale, 1/760,320 or 1 inch to 12 miles. Intelligence Division, War Office. No. 1146. * The Director of Military Intelligence.
- Map of the Nandi Country. Compiled by Lieut. Vandeleur. Scale, 1/292,176 or 1 inch to 4 Geographical miles. Intelligence Division, War Office. No. 1169. June, 1896. * The Director of Military Intelligence.
- Map of Expedition to Lake Rudolf, 1894-95, by Dr. A. Donaldson Smith. In 5 sheets. 4 sheets, Scale 1/1,000,000. Return Journey, 1 sheet, Scale 1/2,000,000. Published by the Geographical Society. * The Society.
- Sketch Map of the North East Sudan, to illustrate the paper by J. Theodore Bent. * The Royal Geographical Society.
- Schizzo del Teatro della Guerra Italo-Abissina. Scale, 1/333,000. Edito dall' Istituto Cartografico Italiano. Marzo 1896. * The Institute.
- Map of Nile Valley between Wadi Halfa and Ambugol. Scale, 1/126,720 or 1 inch to 2 miles. Compiled in the Intelligence Division, War Office, under the Direction of Lieut.-Col. J. K. Trotter, R.A., D.A.A.G., 1894. No. 1067. Revised March, 1896. * The Director of Military Intelligence.
- The Nile from Koyeka to Merowi. Heliozineographed at the Ordnance Survey Office, 1896. Intelligence Division, War Office. No. 1163 (a), (b), (c). * The Director.
- Map of the Nile Valley between Absarat and Firket. Scale, 1/126,720, or 1 inch to 2 miles. Intelligence Division, War Office. No. 1180. 1896. * The Director of Military Intelligence.

AMERICA.

- The Barren Lands of Canada, Map showing route followed by Mr. J. B. Tyrrell. 1/4,000,000 or 63 miles to an inch. Royal Geographical Society, 1895.
- Map of the Valley of Mexico, to illustrate paper by O. H. Howarth. Scale, 1/500,000 or 1 inch to 8 miles. * Royal Geographical Society.
- Maps to accompany Documents and Correspondence relating to the question of Boundary between British Guiana and Venezuela. Nine maps. Venezuela No. 1 (1896). C-7972-1. * Sir W. H. Houldsworth, Bart., M.P.
- Mapa del la Provincia de Catamarca. By G. Lange and E. Delachaux. 1893. Scale, 1/500,000, in 4 sheets. Atlas Geografico de la República Argentina. Museo de la Plata. * F. P. Moreno, Director del Museo.

ATLASES, PHOTOGRAPHS, &c.

- Historical Atlas of Modern Europe, from the Decline of the Roman Empire. Comprising also Maps of parts of Asia and of the New World connected with European History. Edited by R. L. Poole, M.A., Ph.D. (See List of Exchanges.) * The Clarendon Press, Oxford.
- Atlas of Phil. Cluverio. * Mr. J. Edwards.
- The Gleaner's Atlas, and Key to the Cycle of Prayer. London: Church Missionary Society, 1895.
- Almanach Hachette, 1896. Maps and illustrations. Hachette and Cie, Paris.
- Twenty-one Views of Congleton and Neighbourhood.

BOOKS.

GENERAL.

- Projet de Carte de la Terre à l'échelle du 1/1,000,000e. Rapport présenté au Congrès de Lorient. Par J. V. Barbier. * The Author.
- Introduction to Universal Geography. By Rev. R. Turner. Illustrated. Ninth Edition. London: J. Johnson, &c., 1800. * Mr. J. Howard Reed.
- Sixth International Geographical Congress, held in London, 1895. Report. Edited by the Secretaries. With maps and illustrations. London: J. Murray, 1896. * The Congress.
- A Geography Lesson. The Blackboard and Oral Teaching. By E. R. Wethey, M.A., F.R.G.S. Printed by request of the Geographical Association. London: G. Philip and Son, 1896. * The Association.
- British Empire League. Report of Inaugural Meeting, Wednesday, January 29th, 1896. London. * The League.
- The British Trade Journal. Vol. XXXIV., 405, Sept., 1896. * Mr. E. Sutton.
- The Sugar Cane. 295, February 1, 1894; 325, August, 1896. With remarks about British Consular Reports. * Mr. E. Sutton.
- Colonial Conference, 1894. Further Correspondence between Sir C. Tupper and Sir J. Pender on the Subject of a Proposed Pacific Cable. [C-76, B 2.]
- A Collection of Authentic, Useful, and Entertaining Voyages and Discoveries. By John Barrow, Esq. 3 vols. London, 1765.
- The Cruise of H.M.S. Galatea, Captain H.R.H. the Duke of Edinburgh, K.G., in 1867-8. By Rev. J. Milner and O. W. Brierley. London: Allen, 1869.

384 *The Journal of the Manchester Geographical Society.*

- A Primer of Modern Missions. Edited by R. Lovett, M.A. London: Religious Tract Society, 1896.
- The Story of the Year 1895-6, by Sarah G. Stock. With map and illustrations. London: Church Missionary Society, 1896.
- La Spéléologie. By E. A. Martel. Assoc. Fr. pour l'Av. des Sciences. Besançon, 1893. *The Author.
- Ocean Rainfall, with Chart and Tables, 1864-1875. By W. G. Black, F.R.M.G. *The Author.
- Rudolf Falb's Wetter-Prognosen und Kalender der Kritischen Tage, Januar bis Juni, 1896. Berlin: H. Steinitz. *Surgeon-Major W. G. Black.
- The Alleged Leakage of Artesian Water. By J. P. Thomson, F.R.S.G.S. *The Author.
- Science Education of, 1852 and 1848. Photographic Copies from Educational Posters. *Mr. John Angell.
- Protection for Agricultural Staples by an export County. By David Lubin. Sacramento, Cal., 1896.
- La Cornoide. By Alberto Sanchez. With diagram. San Salvador, 1895. *The Author.
- L'Évolution et le Dogne. Par M. le Marquis de Nadaillac. *The Author.

BRITISH ISLES.

- Catalogue of the Maps and Plans and Other Publications of the Ordnance Survey of England and Wales, and the Isle of Man, to 1st January, 1896. Colonel J. Farquharson, C.B., R.E., Director General of the Ordnance Surveys. Southampton. *E. Stanford, London.
- Report of the Progress of the Ordnance Survey, to the 31st December, 1894. (C 7747).
- Minutes of Evidence taken before the Departmental Committee appointed by the Board of Agriculture to consider the arrangements to be made for the Sale of Ordnance Survey Maps, with Appendices and Index. (C 8148). 1896. *Mr. J. J. Thomson.
- Reports of the Departmental Committee appointed by the Board of Agriculture to consider the arrangements to be made for the Sale of Ordnance Survey Maps. (C 8147). 1896. *Mr. J. J. Thomson.
- Board of Trade Journal of Tariff and Trade Notices, and Miscellaneous Commercial Information. Nos. 6 to 31, 33 to 39, 41 to 43, 48, 54, 55, 57 to 96, 98. *Mr. I. Chorlton.
- Historical Account of the Navigable Rivers, Canals, and Railways Throughout Great Britain, as a reference to Nichols, Priestly and Walker's New Map of Inland Navigation, derived from original and parliamentary documents in the possession of Joseph Priestley, Esq. London: Longman and Green, 1831. *Mr. D. Ainsworth Little.
- Railway Returns for England and Wales, Scotland, and Ireland for the year 1894. With Summary Returns for United Kingdom for each year from 1854 to 1894. (C 7797). 1895.
- Summaries of Statistics Relating to the Mines and Minerals of the United Kingdom, obtained by Her Majesty's Inspectors of Mines; also List of Inspectors and Districts (C 7166).
- Mineral Statistics of the United Kingdom of Great Britain and Ireland, with the Isle of Man, for the year 1894. (C 7873).
- Agricultural Returns for Great Britain, 1894 (C 7698). *Sir W. H. Houldsworth, Bart., M.P.
- Board of Agriculture Report on the Distribution of Grants for Agriculture Education in Great Britain in the Financial Year, 1894-95, with an Appendix (C 7777). *Sir W. H. Houldsworth, Bart., M.P.

- Report of the Committee of Council on Education (England and Wales) 1894-95. (C 7776-1). *Sir W. H. Houldsworth, Bart., M.P.
- Forty-second Report of the Department of Science and Art. Committee of Council on Education, with appendices (C 7693). *Sir W. H. Houldsworth, Bart., M.P.
- Education Department, Revised Instructions issued to H. M. Inspectors, 1895. (C 7653). Sir W. H. Houldsworth, Bart., M.P.
- Education Department. 1895. Code of Regulations for Day Schools. (C 7652). *Sir W. H. Houldsworth, Bart., M.P.
- Directory for Science and Art Schools and Classes, 1895 (C 7733). *Sir W. H. Houldsworth, Bart., M.P.
- Education Department. Training Colleges. Reports for the year 1894 (C 7766, C 7813). *Sir W. H. Houldsworth, Bart., M.P.
- Elementary Education in Relation to Evening Continuation Schools and to the Duties of After-life. By C. S. Roundell. Yorkshire Union of Mechanics' Institutes, 1896. *The Author.
- Commercial. No. 4 (1895). Reports from Her Majesty's Representatives Abroad on the Educational Standard for the Merchant Navy (C 7711). *Sir W. H. Houldsworth, Bart., M.P.
- Industrial Explorings in and around London. By R. Andam. With nearly 100 Illustrations by T. M. R. Whitwell. 2nd Edition. London: J. Clarke and Co., 1896. *The Author.
- Tantallon Castle: the Story of the Castle and of the Ship, told by Elizabeth R. Pennell, and fully Illustrated. Edinburgh: for the Castle Mail Packets Co. Ltd., 1895. *Messrs. Donald Currie and Co.
- Official Guide to the North Wales Narrow Gauge (2ft.) or "Toy" Railway, Illustrated.
- Notes on the Parish Churches of Wirral. By Wm. F. Irvine. Liverpool: Henry Young and Sons, 1896. *The Author.
- Notes on a Series of Fossil Footprints from Storeton in Cheshire. By Osmund W. Jeffs. With three Photographic Plates. Liverpool Geological Association, 1894. *The Author.
- Industrial Lancashire. Some Manufacturing Towns and their Surroundings. By John Mortimer. Manchester: H. Bannerman and Sons, Ltd., 1897. *The Author.
- Road and Lane: A Handbook for Manchester Cyclists and Tourists. By Haydon Perry.
- Mercantile Manchester, Past and Present. By John Mortimer. Illustrated. Manchester: Palmer and Howe, 1896. *The Author.
- Manchester Ship Canal Bill, 1896.
- Manchester Public Free Libraries. The Free Library Movement in Manchester. By William R. Credland. 1895. *The Author.
- Corporation of Manchester Art Gallery. Fourteenth Autumn Exhibition, 1896. Catalogue.
- The Manchester Whitworth Institute Charter of Incorporation Sealed 2nd October 1889.
- Manchester Whitworth Institute. Catalogue, 1894.
- Manchester Whitworth Institute. Water Colour Drawings, October, 1896.
- The Manchester Art Museum. Annual Report, 1895-96.
- Report of the Eight Years' Work of the Salford Dock Mission. 1895.
- Nineteenth Annual Report of the Working Men's Clubs Association for 1895 and 1896.
- Salford Authors, Old and New. A Lecture delivered in the Town Hall, Pendleton, on December 12th, 1895. By Thomas Costley. *The Author.
- Short Prospectus of Day and Evening Classes, Session 1896-7, Royal Technical Institute, Salford.

386 *The Journal of the Manchester Geographical Society.*

- A Sketch of the Geological Features of Rossendale. By Herbert Bolton, Assistant-Keeper, Manchester Museum. *The Author.
- The Geology of Rossendale. By Herbert Bolton, F.R.S.E. Illustrated. Bacup: Tyne and Shepherd. (2 copies.) *The Author.
- Handbook to Cleckheaton and the Neighbourhood. By Frank Peel, F.S.A.S. Illustrated. Compiled for the 59th Meeting of the Yorkshire Union of Mechanics' Institutes, 1896. *The Union.
- Story of a Limestone Cave (Victoria Cave, near Settle). By J. J. Gleave. *The Author.
- Report of the Committee of Council on Education in Scotland, 1894-95 (C 7816-1). *Sir W. H. Houldsworth, Bart., M.P.
- Education (Scotland), Northern Division General Report for the Year 1894. By T. A. Stewart, M.A., LL.D. (C 7761). *Sir W. H. Houldsworth, Bart., M.P.
- Secondary Education (Scotland). Report for 1895. By H. Craik, C.B. (C 7886). *Sir W. H. Houldsworth, Bart., M.P.
- 1895 Scotch Code of Regulations for Evening Continuation Schools, with Schedule and Appendices (C 7664).
- On some Coleoptera from the Summit of Ben Nevis, collected by W. S. Bruce. By Rev. A. Thornley, M.A. *The Author.
- 61st Report of the Commissioners of National Education in Ireland, 1894 (C 7796). *Sir W. H. Houldsworth, Bart., M.P.
- Report of the Intermediate Education Board for Ireland for the Year 1894 (C 7677). *Sir W. H. Houldsworth, Bart., M.P.
- Agricultural Statistics, Ireland, 1895 (C 7798). *Sir W. H. Houldsworth, Bart., M.P.

EUROPE.

- Les Abîmes, les Eaux Souterraines, les Caverns, les Sources, la Spéologie. Explorations souterraines effectuées de 1888 à 1893 en France, Belgique, Autriche, et Grèce. By E. A. Martel. Maps, plans, illustrations, &c. Paris: Delagrave, 1894. *Miss Betham-Edwards.
- Foreign Office. 1895. Miscellaneous Series, No. 349. Reports of Subjects of General and Commercial Interest. Norway. *Sir W. H. Houldsworth, Bart., M.P.
- Traversée du Glacier du Jostedal, Norvège. By Madame Aline Martel, C.A.F. Paris, 1895. *M. E. A. Martel.
- Fridtjof Nansen. 1861-1893. By W. C. Brøgger and Nordahl Rolfsen. Translated by William Archer. With numerous illustrations and maps. London: Longmans, Green, and Co. *The Publishers.
- Foreign Office. 1895. Annual Series, No. 1616. Diplomatic and Consular Report on Trade and Finance. Sweden (C 7828-33). *Sir W. H. Houldsworth, Bart., M.P.
- State Aid to All Efficient Schools Alike. How it Works in Secondary Schools in Denmark. By J. S. Thornton, B.A. London: George Philip and Son, 1895. *The Author.
- Foreign Office, 1895. Annual Series, No. 1620. Diplomatic and Consular Reports on Trade and Finance. Russia (C 7828-37). *Sir W. H. Houldsworth, Bart., M.P.
- Foreign Office, 1895. Miscellaneous Series, Nos. 355 and 356. Reports on Subject of General and Commercial Interest. Russia (C 7582-16, 7582-17). *Sir W. H. Houldsworth, Bart., M.P.
- Correspondence respecting the Agreement with Russia relative to the Seal Fishery in the North Pacific (C 7713)

- A Tour performed in the years 1795-6, through the Taurida or Crimea, the Antient Kingdom Bosphorus, the once-powerful Republic of Tauric, Cherson, &c. By Mrs. Maria Guthrie. Edited by Dr. M. Guthrie. London, 1802.
- Foreign Office, 1895. Annual Series, No. 1617. Diplomatic and Consular Reports on Trade and Finance. Germany (C 7828-34). * Sir W. H. Houldsworth, Bart., M.P.
- Foreign Office, 1895. Annual Series, No. 1623. Diplomatic and Consular Reports on Trade and Finance. Germany (C 7828-45). * Sir W. H. Houldsworth, Bart., M.P.
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392 *The Journal of the Manchester Geographical Society.*

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394 *The Journal of the Manchester Geographical Society.*

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396 *The Journal of the Manchester Geographical Society.*

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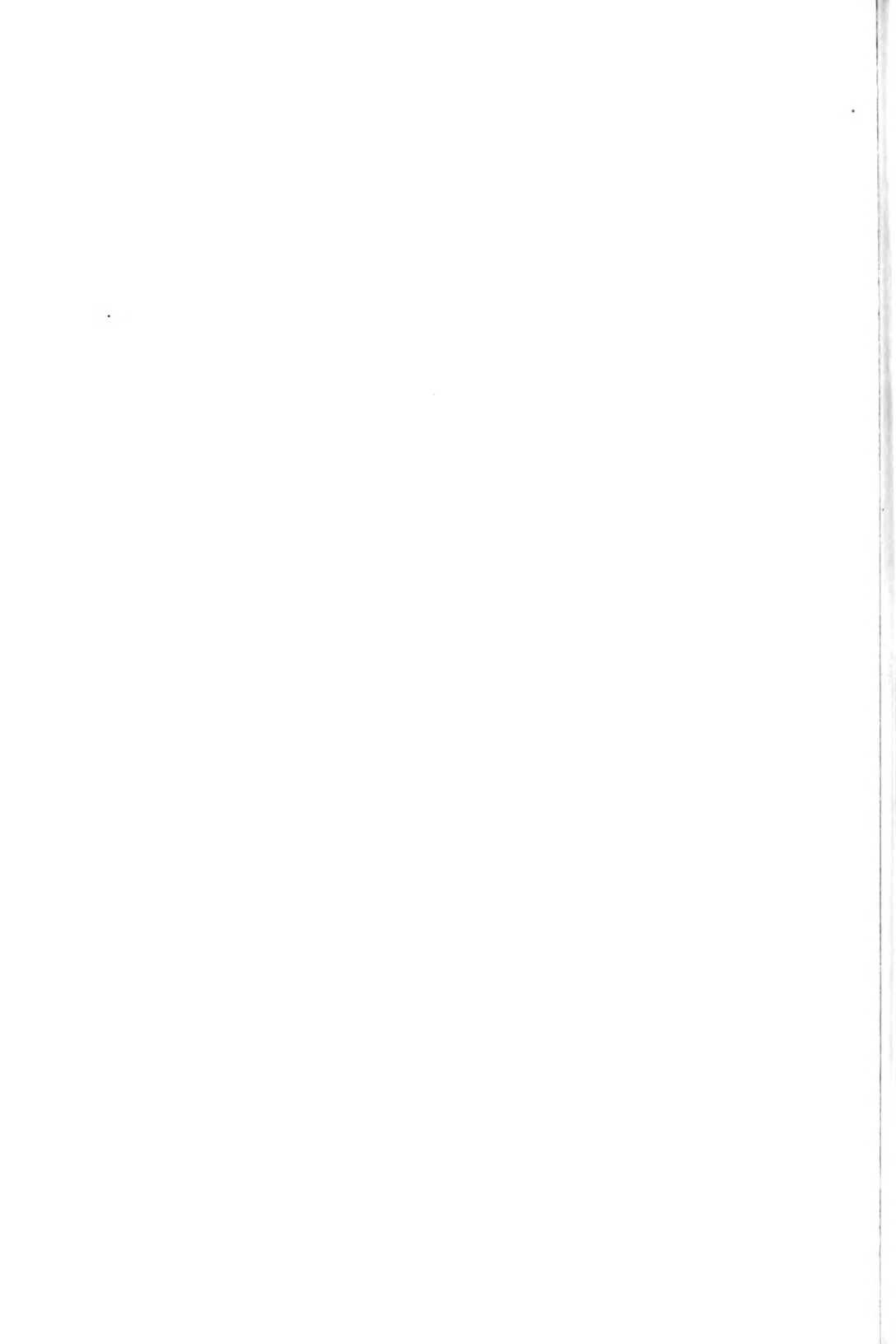
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P

6

11EF

" <i>Furthest North.</i> By Fridtjof Nansen." ..	124
Flora Cape	730
Foreign Corresponding Societies.....	230
Fram, The.....	50
Franecker	23
Franz Josef Land, Jackson-Harrisworth Expedition	78
— — — — Nansen and Jackson on	68

	PAGE		PAGE
P		The Country of Cashmere—Rt. Hon. Sir	
Peck District and Northern Counties Foot-		R. Temple, Bart., &c.	139
paths Society 159		The Danube and the Opening of the Iron	
Pir Panjal Range 140		Gates—Alderman I. Bowes.....	107
Polar Expedition, The Jackson-Harms-		" <i>The First Crossing of Spitzbergen, &c.</i> " By	
worth..... 73		Sir W. M. Conway, &c.	106
Proceedings of the Society 146, 205		The Furthest North—Dr. F. Nansen.....	47
" <i>Problems of Nature, Discoveries of G. Jäger,</i>		The Jackson-Harmsworth Polar Expedi-	
<i>M.D. By H. G. Schlichter, D.Sc.</i>	46	tion—A. Montefiore Brice, F.G.S.	73
Q		" <i>The Lakes and Rivers of Austria, Bacteria,</i>	
Queen, The Diamond Jubilee of Her		<i>and Hungary. By Col. G. E. Mallet-</i>	
Majesty the..... 116		<i>son, C.S.I.</i> " 80	
R		" <i>The Mirror of the Sinful Soul</i> " 46	
Report on the Eleventh International Con-		The Shetland Islands—E. J. Russell, B.Sc.	125
gress of Orientalists, Paris, 1897.—		The Track of the Moors in Spain—S. Wells.	207
Rev. L. C. Casartelli, Ph.D.	183	The Upper Waters of the Rivers Irawaddy	
Reviews and Notices of Books..... 46, 80, 105,		and Mekong—Rt. Hon. Sir R.	
114, 119, 138, 143, 188, 204		Temple Bart., P.C., &c.	181
Rhine, The, in Holland 36		" <i>The Year Book of British Columbia and</i>	
Roberts, Miss—Missionaries and Geo-		<i>Manual of Practical Information,</i>	
graphy 194		<i>&c. By R. E. Gosnell</i> " 204	
Roosendaal Castle, Arnhem 26		Tibet: Rivers Flowing South 181	
Russell, E. J., B.Sc.—The Shetland Islands		Travels in Central Asia—Dr. Sven Hedin....	215
Rules of the Society 242			
S		U	
Salford Museum, Peel Park—B. H. Mullen,		Unst Island..... 139	
M.A. 115			
Salford Reference Library, Peel Park, List		V	
of Books on Arctic Travel 97		Vadso..... 93	
Sandakan 166		Vasco da Gama Celebration in Lisbon	212
Sanpo River..... 181		Victoria University, Geography at.....	96
Scotland, The Shetland Islands 125		Village Libraries, Yorkshire..... 210	
—Visit to the Island of Skye 101		Vivian, Revd. W.—Missionaries and Geo-	
Shawe, Rev. F. B.—Missionaries and Geo-		graphy 201	
graphy 196		Vollendam 11	
Shetland Islands, the—E. J. Russell, B.Sc.	125		
Shillong, Effects of Earthquake, 1897.....	143	W	
Skye, Notes on a Visit to the Island of....	101	Wakefield, Mrs.—Missionaries and Geo-	
Smith, Revd. F. C.—Missionaries and Geo-		graphy 195	
graphy 197		Wakefield, Revd. Thomas—Missionaries	
Sneek 24		and Geography 194	
Societies Corresponding, 1897 227		Wardrop, A. T.—North Borneo 156, 165	
Sowerbutts, Eli, F.R.G.S.—History of		Weir, Thomas—Within the Arctic Circle	
Hungary 149		with the Eclipse Expedition..... 81	
—Missionaries and Geography 191		Wells, S., F.R.G.S.—The Track of the	
Spain, Moors in..... 207		Moors in Spain 207	
Spitzbergen, Journey to—C. Gerland,		Wilde, J. D., M.A.—Lyonesse 155	
M.Sc., Ph.D., &c. 155		Windward, Journey of the..... 76	
Stavoren 20		Within the Arctic Circle with the Eclipse	
Steinthal, Revd. S. A.—Missionaries and		Expedition—Thomas Weir..... 81	
Geography 190			
Svartisen Glacier, North Norway 84		Y	
T		" <i>Yaman: Its Early Medical History. By</i>	
Takla-Makan Desert 215		<i>Najm Addin 'Omarah Al-Hakami</i> "....	114
Teaching of Geography 203		Yorkshire Village Libraries 210	
Temple, Rt. Hon. Sir R., Bart., &c.—The		Yssel River 25	
Country of Cashmere 129			
—The Upper Waters of the Rivers Ira-		Z	
waddy and Mekong 181		Zaskar Range 149	
		Zuider Zee 6	
		Zutphen 31	
		Zwolle 27	

MAPS AND ILLUSTRATIONS.

Photographs of the Diamond Jubilee Address to H.M. the Queen.....	116
Ticket designed for the Nansen Meeting	150
Private Boonie	179, 180
Mr. A. Harmsworth.....	75
Dr. Sven Hedin	218
Mr. F. G. Jackson (in Winter dress)	77
The Hon. Sir Henry Keppel, G.C.B., etc.	178
Dr. Fridtjof Nansen	47
Lance-Corporal Ombol	179, 180
Mr. A. Tucker Wardrop	179
Arctic Circle, Diagram illustrating the.....	82
Diagrams illustrating observations made by Thomas Weir during the Eclipse.....	95
Method of determining Form of Earth	91

ARCTIC REGIONS—

Arctic Regions, Map by J. D. Wilde, M.A., to illustrate papers on Arctic Exploration, with list of Explorers and Points reached. <i>Frontispiece</i>	
— Cape Chelyuskin	50
— Digging out the Fram. 1895	51
— East Taimyr, Dr. Nansen and Johansen among the Walruses.....	65
— Members of Nansen's Expedition at Christiania, 1896	69
— The Fram leaving Bergen.....	49

ASIA—

Cape Chelyuskin	50
-----------------------	----

EUROPE—

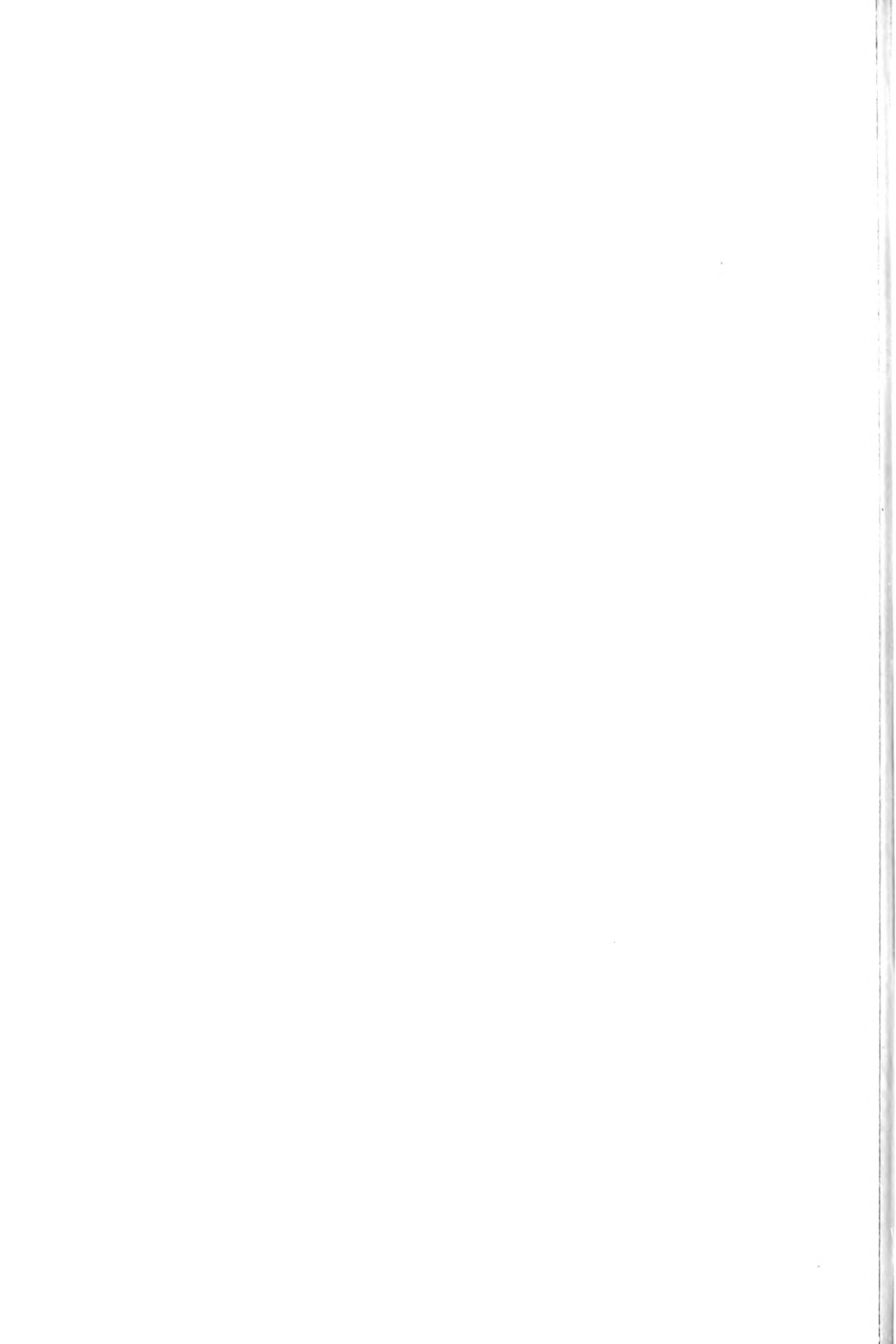
England, Chomlea, Pendleton, View of House	158
— View of Garden	157
— Kinder Scout, Ashop Clough	162
— Hayfield	159
— Leggate Head Moor.....	159
— Nab Brow	160
— Snake Inn, Woodlands	163
— Williams Clough	161
— Map of Kinder Scout District, showing foot-path, 1 inch to 1 mile	164
Holland, Sketch-Map.....	5
— Alkmaar, Weigh-House	18
— Delft, Canal and Odde Kerk	42
— Deventer, Weigh-house	30
— Dordrecht, Inner Harbour	40
— Haarlem, Grootte Kerk, Interior.....	44
— Hoorn, Weigh-house and Grootte Kerk.....	15
— Island of Marken, Widow and Daughters	10
— Junction of Rhine and Yssel	35
— Kampen, Celebroeders' Poort	26
— Vollenham, Fisherman's Cottage	12
— Yssel River, a Tjalk	34
— Zwolle, The Yacht "Dolphin"	28
Norway, Hammerfest Bay	89
— Monument indicating Terminus of Great Russian Arc.....	90
— Harstad from the Wharf	87
— Hestmandiso as seen when crossing the Arctic Circle.....	88
— Svartisen Glacier	85
— The Fram leaving Bergen	49
— Varanger Fjord, Whaler Towing Captured Whale	94
Scotland, Map of Shetland Islands	127

OCEANIA—

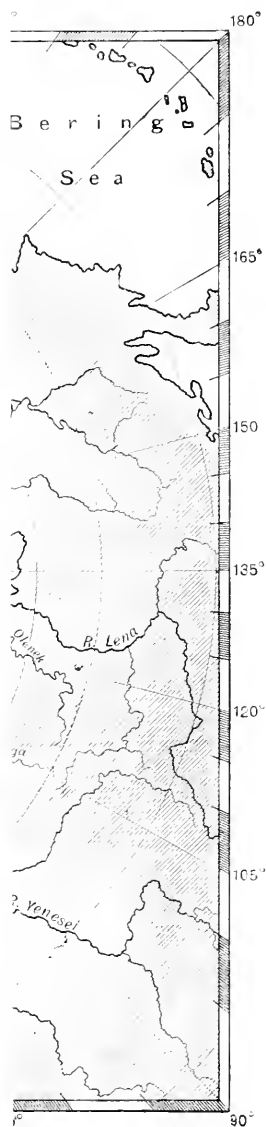
Map of British North Borneo	167
Borneo, North, Coffee Trees	175
— Coconut Plantation	171
— Fruit of the Country	176
— Government House, Labuan	177
— Offices, Sandakan	177
— Lance-Corporal Ombol and Private Boonie	179, 180
— Native Woman Gathering Coffee	174
— View in Sandakan	166
— View of a Tobacco Field	176

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JOURNAL OF THE MANCHESTER GEOGRAPHICAL SOCIETY.

MAP TO ILLUSTRATE PAPERS ON ARCTIC EXPLORATION.

Designed and Drawn by Mr. J. D. Wible, one of the Honorary Secretaries.



LIST OF EXPLORERS AND POINTS REACHED IN THE NORTH

Partly from a list by GENERAL GREELEY, in the *National Geographic Magazine*.

		WESTERN HEMISPHERE.		
COMMANDER	DATE	N. LAT.	LONG.	LOCALITY
John Davis	June 20, 1587	72° 12'	56° W	West Greenland
Henry Hudson	June 20, 1607	73	20 W	Off East Greenland
William Baffin	July 4, 1616	77° 15'	72° W	South Sound
E. A. Inglefield	Aug. 27, 1852	78° 21'	74 W	Do
E. K. Kane	June 24, 1854	80 10'	67 W	Cape Constellation, Greenland, by ship
C. F. Hall	Aug. 30, 1879	82° 11'	61° W	Frozen Sea
Do	June 30, 1871	82° 07'	59° W	Greenland, by ship, U.S. Army
G. S. Nares	Sept. 25, 1875	82 48'	65 W	Grinnell Land, by ship
Do	May 12, 1876	81 20'	65 W	Frozen Sea, by ship, Markham
A. W. Greeley	May 13, 1882	83 24'	11 W	New Land, north of Grinnell Land, by ship, U.S. Army
Lantern	1670	78 20'		East Greenland
Hayes	1861	80 10'		
Peary	1891	81° 37'		
Do	1895	81 37'		
Beaumont	*1876	82 54'		
Peary (Greeley)	1882	82° 54'		
Aldrich	1876	81° 07'		

* 82 21'—85 miles too much

		EASTERN HEMISPHERE.		
COMMANDER	DATE	N. LAT.	LONG.	LOCALITY
William Barents	July 14, 1594	77° 20'	62° E	Neat Cape, Novaya Zemlya
Ryp and Heemskerck (Barents' third voyage)	June 19, 1596	79° 49'	12° E	N. Spitzbergen
Henry Hudson	July 13, 1607	80 23'	19° E	Spitzbergen Sea
J. C. Phipps	July 27, 1773	80 48'	20° E	Do
Wm. Scoresby	May 24, 1806	81° 30'	19° E	Do
W. E. Parry	July 23, 1817	82 45'	20° E	Do
Nordenskiöld and Otter	Sept. 19, 1868	81 42'	18° E	Spitzbergen Sea, by ship
Weyprecht and Payer	April 12, 1874	82° 05'	60° E	Franz Josef Land, highest land
Jackson	1895	81 20'		
Sverdrup	Oct. 16, 1895	85 27'	86° E	
Nansen and Johansen	April 7, 1896	86° 14'	95° E	

Drawn for the Manchester Geographical Society by J. D. Wible 1896.

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MANCHESTER GEOGRAPHICAL SOCIETY.

THE CRUISE OF THE DOLPHIN IN DUTCH WATERS. 1896.

By Mr. E. W. MELLOR, J.P., F.R.G.S., F.I.Inst.

[Addressed to the Society in the Memorial Hall, Monday, January 25th, 1897,
at 7-30]

ALTHOUGH Holland is one of the smallest states in Europe, she possesses a more than common interest, because she is, in the words of a writer (de Amicis), "A conquest made by man over the sea. She is an artificial country; the Hollanders made her; she exists because the Hollanders preserve her; she will vanish whenever the Hollanders shall abandon her." The Hollanders have, indeed, a saying to the effect that "God made the rest of the world, but the Dutch made Holland."

The fact of this conquest of land over water is surely enough to make a visit to Holland a matter of absorbing interest; but when we also remember that these same Dutchmen who maintained this battle with the waves for their foothold, also, although comparatively only a mere handful of men, wrested their civil and religious freedom from a powerful empire, then master of two-thirds of the known world, and that these same Dutchmen sent forth their navies from this small country of Holland to conquer and to colonize in all quarters of the globe, how greatly is that interest intensified. And yet, this evening, we are to visit some of her "dead cities"!

To understand what is meant by the "dead cities," it is necessary to briefly glance at the circumstances attending their rise and fall.

The history of Holland may be divided into four epochs, the first epoch dating from the ninth century, when Holland was included in the empire of Charlemagne. When his empire was broken up, Holland was ruled by a succession of Counts until the year 1428, when the last Countess of Holland, the beautiful and hapless Jacqueline, a girl of seventeen, was dispossessed of her provinces by her bad cousin, Philip of Burgundy, surnamed "the Good." By this time the fisheries

VOL. XIII.—Nos. 1-3—JAN. TO MARCH, 1897.

of Holland were become of enormous importance, bringing great wealth into the country, and training skilled and hardy sailors to man her growing navies.

The second epoch commences with the rule of this Philip of Burgundy. It was he who introduced the Order of the Golden Fleece. He was succeeded by his son Charles "the Bold," of whom Sir Walter Scott gives so graphic an account in "Quentin Durward." Here you may notice an instance of territorial aggrandisement in one family, perhaps unequalled for rapidity anywhere else in history: Charles' daughter, Mary, married Maximilian, afterwards Emperor of Germany; their son, heir to the Netherlands and Germany, married Joanna, daughter of Ferdinand and Isabella of Spain; to them was born a son known in history as Charles V., and whom some writers have called the second Charlemagne. In him Spain was added to the other kingdoms. In the words of the historian Davies, "Charles V. was King of Spain, Sicily, and Jerusalem, Duke of Milan, Emperor of Germany, Dominator of Asia and Africa, and autocrat of half the world." But, besides being so mighty a potentate, Charles V. was a wise statesman, and under his fostering care and powerful protection the commerce and navigation of the Dutch rapidly increased, and they enjoyed a golden era of prosperity. The reformed religion had now widely spread throughout Holland, and Charles V.'s son and successor, Philip II., determined to stamp it out. To this end he sent the Duke of Alva, and an army of 20,000 Spaniards, to enforce the decrees of the Inquisition. This led to the treacherous arrest and execution of the Counts Egmont and Horn by Alva, followed by the hanging and burning at the stake of thousands. Then, up rose the great hero of Holland, William of Nassau, Prince of Orange, surnamed the "Taciturn," who by his patience, foresight, skill, promptness, and military capacity was, with his faithful band of followers, enabled to checkmate every move of Philip II. and his ministers.

After 12 years' brave, persevering, and sanguinary warfare against overwhelming odds, William of Orange and the patriotic Dutchmen announced to the world that they would no longer be subject to the tyrannies of the Spaniards, and in 1579 the foundation of the Dutch Republic was laid.

The third epoch may be described as the period of the Dutch Republic—a Republic which had to fight strenuously for 68 years to maintain its independence, and whose very outset was signalised by the murder at Delft, in 1583, of William (the Silent), the heroic Prince of Orange, called by his grateful countrymen the "Father of Holland." This was the result of the price set upon his head by his malignant enemy, Philip of Spain. After this the Dutch invited Queen Elizabeth of England to become their queen; she declined, but assisted them with troops against Spain, under the Earl of Leicester, and that

flower of English chivalry, Sir Philip Sidney. This culminated the anger of Philip against Elizabeth, and, as you know, he sent out the Spanish Armada for the conquest of England. The Dutch sent a fleet of some 30 vessels to the assistance of their English allies, and the glorious and almost miraculous defeat of the Armada caused no less joy and thanksgiving in Holland than in England. Holland enjoyed some years of rest after she had driven her relentless enemy with such heroism from her boundaries, and the security thus offered, and the freedom of religion, gave an immense impetus and activity to her trade and commerce. Vast multitudes were drawn to her shores. The merchants and artisans expelled for their religion from the Spanish Netherlands transferred their enterprise and skill to Holland, and the manufactures of silk, woollen, linen, lace, tapestry, and innumerable other articles were in the latter part of the sixteenth century carried to a very high degree of perfection in Holland. The population of the towns became so overflowing that it was impossible to build houses fast enough. New and spacious streets and magnificent public buildings were constantly added. The sea coasts and the Zuider Zee coasts were dotted with splendid cities, and noble harbours thickly crowded with masts. The trade with the East Indies assumed such large proportions that the Dutch East India Company was established in 1602.

The cities of Holland seemed now to have arrived at the summit of their prosperity. As long as the Dutch were compelled to struggle for their existence they displayed a courage, energy, and nobility of character which stimulated them to success; but the necessity for that struggle having passed, a change came over their spirit, and their endeavours for the benefit of the commonwealth were subordinated to their efforts for personal gain. As with individuals, so with communities, each town sought its own advantage at the expense of its neighbour. Hence arose parties and factions, bitterness and rancour between the partisans; and the seventeenth century saw internal discords, religious dissensions, disputes between Arminians and Gomarists, Remonstrants and Contra-Remonstrants, and so forth, leading to disorder, riot, and bloodshed, and the note was struck which heralded the decay of so many wealthy and densely populated cities.

While by these causes being enervated, Holland was constantly engaged in wars by either France or England, which exhausted her finances, destroyed her navy, and caused the rapid decline of her trade and commerce. Party feeling continued to run so high that, in 1747, the then Prince of Orange was by the Orange party declared Stadtholder, Captain and Admiral-General for ever in the male and female line—thus making him King of Holland to all intents and purposes, though without the name, and the Dutch Republic practically ceased

to exist. This closes the third epoch, the period of the Dutch Republic.*

The fourth epoch is a short and mournful record. The Prince of Orange, the new ruler, began to find, so Davies the historian tells us, "that the perpetual drain of taxation began to exhaust the resources from which it was supplied. The heavy excise on commodities occasioned the price of labour to be raised to an excessive height, in order to enable the artisan to live, hence the Dutch manufacturers were no longer able to sell in foreign markets on the same terms as their competitors, with the result that capital was withdrawn very largely from Dutch industry. These and other adverse influences continued to such an extent that in the year 1781 the cessation of trade was so entire that the public weighing-house at Amsterdam, usually teeming with life and activity, now remained closed altogether, or with but one of its numerous doors open."

This is an example of what took place in other cities. The fine harbours recently so full of shipping were almost deserted, and indeed became largely silted up with sand. The population began to migrate to busier and more prosperous centres, the tenantless houses were falling into decay, and grass commenced growing in the streets.

Thus we see the cities dying, but their final death-blow was struck in 1794. It was again a party fighting for itself, and not for the commonweal, which brought about the fatal blow, not as Macaulay sings of the ancient Romans—

When each was for the State,
And none was for himself.

but the very opposite, for each was for his party and none was for the State.

In the year 1794, then, the Patriot Party, as they called themselves, in their struggle with the Orange party, and with a view of defeating that party, actually invited the troops of the French Republic to invade Holland, pointing out the most vulnerable spots. The First Consul of France—Bonaparte—made short work of Holland; and when the Patriot Party expected the Frenchmen to go quietly away, and leave them the spoils of conquest, and the fruit of their cleverness in the sweets of office, Bonaparte said, "No, I am master," appointing his own governors, and his own brother king.

So Holland became virtually a province of France, and the Holland of history expired, thus terminating the fourth epoch. At the re-arrangement of the European States after the battle of Waterloo, in 1815, the present constitutional monarchy was established in the old Orange family. To-day Holland is prospering chiefly as an agricultural country.

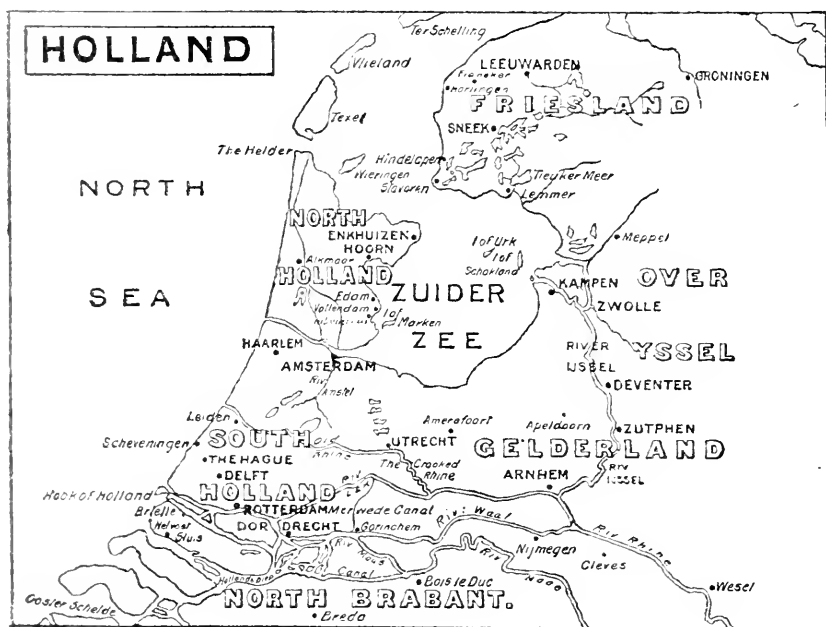
I have sketched a map of that part of Holland which we

* The story of the Dutch Republic has been well told by the American historian, Motley.

visited. It embraces about the northern two-thirds of the kingdom. This part of Holland may be described as the delta of the Rhine, just as we have the delta of the Nile in Egypt.

The Rhine, in its passage through the mountainous districts of Germany, follows a northerly course, but arriving in the low countries it turns round to the west, and divides itself into two arms, the Old Rhine, and the Waal—the Rhenus Bicornis of Virgil, and enclosing the ancient island of the Batavii.

According to Tacitus, these Batavii were the bravest of all the German tribes. Said he, "Others go to battle, these go to war." They were the favourite troops of Cæsar, and down to the



time of Vespasian the Batavian legion was the imperial body-guard.

The Dutch colony of Batavia in Java was named after this ancient island, and indeed the name is still preserved in the modern Dutch name Betuwe, a fertile district bordering the Rhine.

In those ancient times the Zuider Zee did not exist. There was here a dark forest, containing a lake known as Flevo to the Romans, through which flowed the waters of the Yssel. Friesland was united to North Holland by solid land; and Stavoren, now a small village, was a large and busy port, from which goods brought overland, or by river, were exported.

There is a quaint legend relating to the province of Friesland to this effect: About the period of Alexander the Great, three Indian princes, named Friso, Bruno, and Saxo, were compelled to fly from their native land. For eighteen consecutive years the three brothers and their followers were tossed on the seas, seeking a place of rest and finding none, until at length their ship was driven by the stormy North Sea into the mouth of the former River Flevo. Landing on the strange shore, they immediately commenced building a temple to Jupiter, who was called in their language "Stavo." Here they founded the town, which from the temple of Stavo was called Stavoren, a name which survives to this day. Friso took possession of the province, and named it Friesland after himself. He sent his two brothers away, and Bruno founded Brunswick, and Saxo, travelling still further, founded Saxony. So runs the legend.

The name Holland aptly described the chief characteristic of the country, hollow-land, or land lying for the greater part below the level of the sea.

The Rivers Rhine, Waal, and Maas are of great width, in some places nearly a mile wide, and bring down to the sea enormous volumes of water.

We can readily understand, therefore, that when the wind blows heavily from the west, or north-west, the waters of the rivers are forced back upon themselves and the sea is driven into their channels, resulting in terrible inundations over the surrounding lower-lying country.

The Zuider Zee is due to one of these terrific storms and inundations in the thirteenth century.

The gale drove in the sea between Texel and the neighbouring islands, damming up the waters of the ancient lake and river, until the isthmus connecting North Holland and Friesland could withstand the pressure no longer; a breach was made which became wider and wider, the waters poured down into the surrounding lower-lying country waiting like a basin to receive them, sweeping away thousands of human beings, their homes, and fertile lands. Thus was the birth of the Zuider Zee, or, as it sometimes is called, "The Youngest of Seas."

To guard against any such catastrophe in the present or future, the whole coast-line of Holland, including that of the Zuider Zee, is protected by an immense embankment, or dyke, as it is termed. These dykes are splendid works everywhere, and in many places colossal engineering undertakings.

Holland may, therefore, be described as a huge fortress, presenting an impregnable rampart to the attacks of her insidious foe, the sea.

Approaching the Dutch coast, the church towers and house roofs may be seen rising above this rampart, but the towns themselves cannot be seen until the dykes have been mounted.

Here, too, the Dutch found a magnificent engine of war, for when other resources failed them they had but to open the sluice-gates, and the inflowing rush of water covered friend and foe alike. Several times they resorted to this mode of warfare, deeming it better to ruin their land for the time than to be driven altogether from it. Notably was this done in the Spanish war, and during the invasion of Louis XIV. in 1672.

But even this did not avail to stop the progress of Bonaparte in 1794. It was a very severe winter, and the waters were frozen. The French troops actually marched on the frozen surface of the river to the siege of Dordrecht.

But the dykes would be of little practical service if the land which they defend could not be drained; they have, however, been so well and soundly constructed that the admission of water has been prevented, and marshes and lakes have been pumped dry and converted into useful and fertile land. The areas of land thus recovered are called "polders," a word derived from "poel" a pool. One of the most famous of these engineering works was the draining of the lake which existed near Haarlem. It covered 45,230 acres, and was a source of danger to the surrounding country. Pumping commenced in 1842, and in 39 months, 32,668,000 cubic feet of water were pumped out. The drainage of the lake cost £960,000; the land reclaimed was sold for £800,000, but it now annually produces crops valued at £240,000. So successful are these polders that the Dutch are emboldened to seriously contemplate the drainage of the Zuider Zee. The idea is to construct a big dyke, 25 miles in length, from Enhuizen to a point below the embouchure of the Yssel river, and then pump out the water; it is proposed to build a large harbour at the island of Urk, and a ship canal from Amsterdam. The area of Zuider Zee to be reclaimed is estimated at 486,000 acres, and the cost £16,000,000, which seems to me a moderate amount.

The Maas and the Rhine with its branches are magnificent rivers, and splendid water highways, up and down which there is a constant stream of traffic—some of it to and from far-distant German towns.

In addition to these large rivers, there are upwards of 1,500 miles of navigable canals, which I do not show in the map. They ramify the country in all directions, joining the Dutch towns, connecting the meres of Friesland, and converting inland cities into veritable ports. It is, therefore, possible, with a vessel of not too deep a draught, to get from any one point to any other point in Holland by water; moreover, as nearly the whole country lies below the level of the sea, and as water is so abundant in the forms of inland sea, lake, river, and canal, it is essentially a country to visit by water.

Hence my reason for chartering a yacht for this cruise.

Embarking on board the Dolphin at Amsterdam, we called first at Monnikendam, one of the dead cities of the Zuider Zee; from there we visited the low-lying island of Marken, with its quaint fisher-folk population; thence we returned to Vollandam, a fishing village on the mainland. Thence we went to another dead city, Edam, famous for its cheeses. Then we sailed to Hoorn, also a dead city, but now a considerable market-town for cheese and agricultural produce.

It was from here that the fleet sailed which discovered Cape Hoorn, and which was named after this town. We then visited Alkmaar, the great centre of the Dutch cheese trade. Next we visited Enkhuizen, formerly queen of the Zuider Zee, but now a very dead city indeed. It is to-day the terminus of the railway line from Amsterdam, and where the railway steamboats carry passengers to the train at Stavoren for Friesland and Groningen.

Now crossing the Zuider Zee, we came to the fishing town of Stavoren in Friesland, named, you will remember, after Stavo or Jupiter; and we then made for the apparently quite deserted harbour of Hindeloopen. After calling at the former university town of Franeker, we visited Leeuwarden, the capital of Friesland. Thence we sailed through the Frisian meres to the picturesque town of Sneek, which, with Leeuwarden, I have called inland ports, from the facility of their access by water, and from the number of steamboats and sailing craft to be seen there. Then out into the Zuider Zee again, and after a stormy sail in half a gale from the south-west, we safely reached Kampen well within the mouth of the Yssel.

Then maintaining a steady course up the Yssel we ran in to the prettily situated town of Zwolle, Deventer with its huge church, and Zutphen where the gallant Sir Philip Sidney fell.

We then reached the junction of the Rhine and Yssel, or rather where the Yssel branches away from the Rhine, on her separate course to the Zuider Zee. The course of the Dolphin now lay down the Rhine and we called at the beautiful city of Arnhem.

Here, I should tell you, we found the temperature far warmer than on the Zuider Zee. The Rhine flows towards the North Sea, and is known as it passes through Utrecht, as the Old or the Crooked Rhine.

The Dolphin followed the Rhine for about a day, then passed through the Zederick Canal to Gorinchem, and out into that enormous expanse of water, where the Waal branch of the Rhine and the Maas unite.

Sailing down the Maas, we arrived at the ancient city of Dordrecht, after which we had only one more day's sailing on the Dolphin towards the coast. The cities of Rotterdam and Amsterdam are so well known to travellers and tourists that I will not attempt to describe them.

The *Dolphin* is an 18 ton cutter yacht, Dutch built and owned, drawing 5ft. of water, and therefore well adapted to the shallow waters of the *Zuider Zee*, the rivers, canals, and *Friesland meres*. She was painted white, and flew the Union Jack from the flagstaff aft.

Our crew consisted of the commodore, Andrès the cook-boy, the purser, and our A.B., whom we christened "Bacey," from his fondness for that succulent refreshment, the skipper, and myself, who passed as cabin boy. The *Dolphin* is a capital sea-boat, and the weeks we passed aboard of her were very happily spent.

MONNIKENDAM.

We landed first at the *Zuider Zee* town of Monnikendam. Nearly 700 years ago, a few monks founded a convent on this spot, and a little town sprang up round the convent. A bank or dam was made to keep out the sea, and from this the town took its name—Monnikendam, the dam or town of the monks. By degrees Monnikendam became a large and prosperous city, and well able to take a large share in the struggle for freedom from the Spanish yoke. In 1573 she equipped a fleet of vessels, which, in conjunction with those of Hoorn and Enkhuizen, destroyed the Spanish fleet on the *Zuider Zee*, and took the Spanish Admiral de Bossu, prisoner. Monnikendam retains his collar of the Golden Fleece as a trophy.

To look at the almost lifeless streets of this dead city it is difficult to believe that Monnikendam was once a large, busy, rich, bustling place. The bell-tower, or campanile, of the adjacent *Stadhuis*, or Town Hall, was built in 1591. The open belfry carries a peal of bells; when the hour strikes, a little figure sounds his trumpet, and a cavalcade of figures appears. Monnikendam now does an annual trade of some 200 tons of cheese, and about £8,000 worth of fresh herrings.

ISLAND OF MARKEN.

Sailing out from here into the *Zuider Zee* for about two miles, we came to the island of Marken; a passage in stormy weather of great difficulty, owing to the numerous shallows. The island is but very little above the level of the sea, and is therefore frequently inundated, especially in winter.

The usual type of house is built of wood, and is with its haystack raised on piles, that they may be above the surface of the water when the island is flooded.

The appearance of Marken from a distance across the waters of the *Zuider Zee* is very peculiar and picturesque—the red, green, and black wooden houses, with their bright red tiled roofs, seem to stand out of the water. From this, the island of

Marken has been compared to a green raft in a grey sea. The periodical inundations prevent the growth of trees, or cattle remaining on the island. A few sheep are brought in the summer months, to eat off the grass, before finding their way to the butchers' shops on the mainland. When not inundated, the island of Marken forms one large meadow, the hay from which is largely shipped to the mainland.

The Marken men are all fishermen, and go off in their fishing-boats on Monday morning, not returning until Saturday. When hay-time comes, German mowers invade the island; when the grass is all cut, these mowers silently leave the island



WIDOW AND DAUGHTERS, ISLAND OF MARKEN.

to find similar work in more northern countries. When the mowers are gone, and not till then, the women, young and old, emerge from their homes, shake out the hay, and carry out all the operations of hay-making.

The houses are raised on piles, and access to them is gained by the flights of stairs and galleries. When the land is all submerged, leaving only the houses above water, intercourse between neighbours is entirely dependent on boats.

All coming and going must be done in this manner, and sometimes even there is the sad spectacle of a funeral boat moving from a house door to the cemetery.

There are eight hillocks, or mounds, in Marken, one of which is the Kirkhoft, or Cemetery. Advantage is taken of the other seven mounds to cluster houses upon them, so as to be above the level of the inundations.

The Markenaars are proverbially skilful fishermen, and they find their calling sufficiently remunerative to keep them in comfort and to add to their store. They are a primitive race, and very simple in their wants. A writer has spoken of them as rich, not merely by such money as they can earn, but by the absence of the desire for that they do not require.

The Markenaars preserve intact the simplicity of the manners, customs, and dress of 600 years ago, notwithstanding their proximity to the mainland and to a large city like Amsterdam.

No one abandons the island—they marry among themselves, and no strangers settle there—so that the costumes we see these good people wearing to-day are the same as those worn by their grandparents, and for generations back for hundreds of years.

We visited a widow woman and her daughters on the island of Marken. Their faces were bronzed with open-air work and exposure to weather. All the Marken women wear large white caps: they are scrupulously clean, and have been compared to a bishop's mitre. The hair is worn in long ringlets each side of the face. The rest of the dress is too complicated for a description by me! I will only say that the corsage is generally covered with embroidery in bright colours. This forms part of the winter work of the women. Some of the embroidery is very complicated, and requires years of labour. A corsage so embroidered is handed down from mother to daughter as an heirloom.

VOLLENDAM.

We now bid farewell to the interesting island of Marken, and, steering a north-westerly course, we arrive at the fishing hamlet (for it is scarcely a town) of Vollandam, on the mainland. This can only be done by numerous tackings, owing to the shallowness in places of the *Zuider Zee*.

We photographed the haven, or harbour, of Vollandam, with two fishing boats lying up to the dyke. The town itself is hidden on the other side of the dyke, and you see the upper part of the houses standing above it.

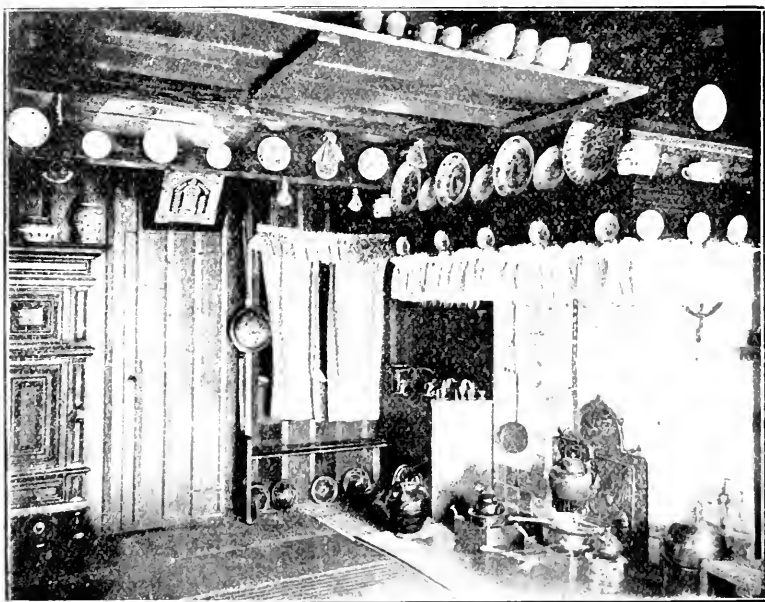
Numerous artists resort to this little town, and find many quaint and characteristic bits of Dutch form, costume, and colouring. Let us land, and pass down to the town side of the dyke. Behind this dyke the houses are crowded pretty closely together.

We cross a narrow canal by a footbridge. A boy is standing on the footbridge who is a young fisherman. He has a curious costume, with the immensely baggy trousers so much affected

by the Zuider Zee fisher-folk. Mounting some stairs at the end of the street we are on the dyke, and the harbour and Zuider Zee are before us.

We tried to imagine the effect of the sea bursting through that firm-looking wall, the drowning out of this town, and the wide-spread disaster which would overtake the flat surrounding country. We could then estimate the force of the statement that Holland exists only so long as the Dutch maintain the fight with the waves, by never neglecting the repair of these dykes.

In this connection, let me recommend to your notice a beautiful and touching little poem, too long to quote here, by



FISHERMAN'S COTTAGE AT VOLLENDAM, ZUIDER ZEE.

Phoebe Cary, called the "Leak in the Dyke," relating how a little boy attempted to stop a leaking dyke with his arm—an effort which cost him his life. Then, too, read the "Inundations at Scheveningen," by Charles Swain.

In visiting one of the fishermen's houses at Vollenham, we were at once struck with its marvellous cleanliness and order. The walls and door are of timber; the fireplace is built of brick and lined with blue delf tiles. All the utensils shine with the most brilliant polish. The pottery of the house decorates the walls.

In a cupboard-like recess in the wall is the bed, screened by two curtains. The vrouw uses a long stick to spread the linen evenly over the bed, as she cannot reach the further side.

Throughout Holland, the beds of the farmers and peasantry are placed in these cupboard-like holes in the wall, and we ourselves had the experience of sleeping in such beds.

The floor is covered with matting, and above is a broad shelf carrying the wooden shoes, or sabots, of the family.

Paper ornaments to attract flies hang down from the ceiling, and over the door is a large funeral-card, a species of decoration which we not infrequently see in England.

About a mile and a half from Vollandam is Edam, one of the most dead of the dead cities.

EDAM.

Notwithstanding her fallen fortunes, Edam has for the last three centuries been famous for its cheese. It is reported that in 1649, a date rather before Edam would reach her high tide of prosperity, 500 tons of cheese were exported, having the same red-coloured rind that it has to this day.

All the school children of Edam seemed determined to be taken in our photographs, but, lively though they were, I could not shake off the melancholy feeling caused by the dark, gloomy street, between the stones of which the moss and grass is growing, although it is the principal street of the town.

At the time of her greatness, Edam ranked as one of the five principal cities of Holland, and in 1571 she supported the cause of William "the Taciturn" against the Spaniards, with a full contribution of men and money. Edam then had a population of 25,000; this has dwindled away to about 4,000 now.

A fine bridge leads over the canal to a small square, in which is the stadhuis, or town hall, the reflection of which building is seen in the water. We sail down this canal to the Zuider Zee. The canal is fed from the river Y, hence the name Ydam, or Edam. The town is quite a considerable distance from the Zuider Zee, which stretches out in the horizon before us. From the deserted appearance of this canal, it is difficult to believe that here formerly congregated merchantmen and fighting ships.

There is a tradition that in 1403, a siren came floating up the canal from the sea. She was caught in the nets, and the good Edam folks exchanged her covering of seaweed for a proper dress, and tried to teach her to spin, and to sew, and to talk, but all of no avail, for one fine day she gave them the slip, and went swimming down this canal out into the Zuider Zee again.

There have been persons so incredulous as to declare that it was neither a woman, nor a mermaid, nor a siren at all, but an

unlucky seal which had somehow lost its way up here. Be that as it may, I have given you the tradition.

HOORN.

We now ourselves passed out to sea, and steered almost due north to Hoorn. Soon the old Water Tower, which stands like a sentinel at the entrance to the port of Hoorn, rises above the horizon. Meanwhile we are sailing over classic ground, for here was fought the great naval battle in 1573, when the fleet of the Spanish Admiral de Bossu was dispersed by the combined ships of Hoorn, Enkhuizen, and Monnikendam, and the Spanish Admiral himself taken prisoner, brought into Hoorn, and possibly imprisoned in this tower. Hoorn retains as a trophy, the Admiral's silver gilt drinking-cup. The battle had been raging from three in the afternoon until twilight next morning, when one John Haring, a native of Hoorn, clambered on board the Spanish flagship, the *Inquisition*, and hauled down her colours—a deed of daring for which he paid with his life; he had, however, only briefly anticipated matters.

When I was taking a photograph here, a small boy in a striped cotton sailor suit, the trousers reaching only to his knees, watched my operations very intently, rather suggesting the query:—"What are you doing, playing so near the water, little boy? Where is your nurse?" When I had finished and put away my camera, what does the young twopenny-halfpenny do, but produce two cigarettes from his pocket, one of which to my utter amazement he handed to me, and the other he placed in his mouth with all the quiet self-possession of the most accomplished man about town.

He produced a match from his pocket, but I made signs, not being able to talk Dutch, that the fresh breeze blowing from the sea, would put it out. The small boy then ran behind a shed for shelter; no good, the wind put his matches out. But "young precocity" was not to be beaten. Presently there hove in sight, an ancient mariner kind of party, pulling at a pipe. Young precocity promptly hailed him, got his cigarette going at the venerable pipe, and then with an air of triumph returned to me, and presented the glowing end of his cigarette to kindle mine. Young striped calico and I walked side by side along the jetty, puffing away, and, I trust, full of mutual admiration!

Had I only known him five minutes earlier that astonishing little Dutch boy should have been standing prominently in my photograph, instead of out of sight by my camera. But they all do it in Holland, you would think that the boys were born with tobacco in their mouths. Perhaps the reason is, that, as there is no duty on tobacco, it is very cheap.

Passing the old Water Tower, we entered the inner harbour of Hoorn. What a deserted appearance this harbour of Hoorn has to-day!

And yet in the sixteenth and seventeenth centuries many intrepid heroes went out from here with their fleets and gallant crews. I will name only three. From here went a merchant citizen named Jan Koen, in the service of the Dutch East India Company, to Java, and after defeating the natives by sea and land, built the city of Batavia, sometimes called the queen of the Indian Archipelago.

From here went Willem Schouten, who, avoiding the difficult navigation of the Straits of Magellan, doubled the southernmost point of the new world and called it Cape Hoorn, after this, his native city. From here went Abel Tasman, whose



THE WEIGH-HOUSE AT HOORN, TOWER OF GROOTE KERK IN DISTANCE.
Statue on left of Jan Pietersz Koen, 1587-1629.

name is handed down to us in the land which he discovered—Tasmania. These famous men inspired the Dutch poet, Joost van den Vondel, to write a poem, from which I give you a short extract, as translated by Annie Wood :—

To heroes Hoorn has given birth,
And gallant souls to man her fleets ;
The produce of the faithful earth
In distant lands a market meets.
Where'er the moon on far-off lands
Her silvery light benignly sheds,
There, countless as the yellow sands,
The ships of Hoorn her commerce spreads.

We cannot help a sigh when we remember that this is a description of the past. We walked over the drawbridge into the streets of the town. The old streets are full of irregular shapes and sizes of gables and roofs, many of the houses leaning this way and that. Many have stones let in the walls, bearing dates varying from 1560 to 1670. Those old builders often made the houses lean forward purposely, in order to throw off the rain more readily.

These streets have witnessed some curious scenes. Here is one: The reckless wars of Charles the Bold necessitated greatly increased taxation, so, in 1471, among other things, a heavy excise was imposed on beer. The men of Hoorn would not stand this. The guilds of weavers, fullers, and fishermen marched with their banners through the streets; all the barrels of beer they could find were dragged out, the tops broken in, and an insulting message was sent to the Excise Commissioners, asking how much each had to pay on the beer thus wasted. The ringleaders of this riot were subsequently tried and executed. Again, twenty years later, in 1491, in the reign of Philip II., of Spain, in addition to all other taxes, a heavy ruytergeld was imposed. Ruytergeld is the money paid in lieu of military service. Deputies from the surrounding districts assembled in Hoorn. A protest was made, but the government took no notice. Then the assembled people unanimously resolved to pay no more ruytergeld. Thus began a ruinous agrarian war, called "*Casembrotspel*," or "*Bread and Cheese*" war, because the people painted bread and cheese on their banners, and stitched fragments to their clothing to signify that they were fighting for the necessities of life. The insurgents were routed by the regular troops at Haarlem, many were slain, and the leaders hung on a gallows in the Market Square at Haarlem, and so ended the "*Bread and Cheese*" war.

There is a curious building called the Arsenal, decorated with shields and coats of arms; and we read that in 1549 a member of the Council of the Admiralty was appointed to reside there. Now that the connection of Hoorn with naval matters seems to have disappeared, the building is used as a museum.

We were standing in the Market-place on a Thursday morning, the day on which the cheese market is held.

Carts and waggons had brought vast quantities of the round Dutch cheeses, so familiar to you all, into the town from the surrounding farms. The cheeses are taken from the waggons, and are carefully piled, three or four deep, on the ground. This operation requires to be done somewhat gingerly, or the cheeses go rolling away down the street, the small boys after them. The piles of cheeses rather suggest a stack of cannon balls.

A woman is getting a canvas sheet out of the waggon to spread over the finished piles, as we see the other piles are covered, to keep the heat of the sun off the cheeses.

Although Hoorn is, no doubt, a dead city, in the sense of not being the busy emporium she formerly was, this cheese market prevents her being quite so dead as some of her neighbours on the Zuider Zee. Some 25,000 tons of these cheeses are annually shipped from Hoorn. As soon as a bargain is completed, the cheese is brought to one of the scales in the Weigh-house. Each weighing machine is painted a different colour for each district, and the market porters have hats of the same distinctive colours—there is, therefore, no confusion, each buyer and seller know at once to which weighing machine they must go.

The Weigh-house dates from the seventeenth century, and we noticed the quaint diamond-paned casemented windows, also the arms of the town, a unicorn carrying a shield. The first municipal privileges were granted to Hoorn in the year 1356.

In the distance is seen the tower of the Groote Kerk. In the year 1564 a complaint was made by a priest to the Government of Philip II. of Spain that the authorities of Hoorn were not diligent in punishing heretics. A Commissioner of the Inquisition was therefore sent to hold an enquiry.

On arrival at Hoorn the Commissioner was received with extreme courtesy by the burgomasters and principal personages of the city, who took it in turns to entertain the Commissioner. This they did so effectually that the only movement he was able to make, according to the historian Davies, was "from bed to table, and from table to bed." Everybody who came to give information concerning heretics received the same answer, either that the Commissioner was engaged at meals or that he was asleep. After a week spent in this manner the Commissioner returned to the Court, and reported that he had not heard the slightest complaint of heresy at Hoorn.

This, however, did not avail for very long, for the Inquisition, supported by the Duke of Alva, soon caused hangings and burnings to become horribly frequent.

This street leads to the Doelan Hotel. The landlady was wearing the costume cap of North Holland, a gold plate covered the front of her head, and over this lace was placed. A jewelled plate crossed the forehead, and the whole was fastened at the temples by two large gold ornaments, in shape something like horses' blinkers. This costume is, of course, worn only on holidays and Sundays.

ALKMAAR.

From Hoorn we paid a flying visit to the inland city of Alkmaar, a name which signifies "all mere," or lake, from the number of lagunes and morasses which formerly surrounded it, but which have now been drained off.

Alkmaar, like other Dutch towns, has its streets traversed by canals.

Alkmaar occupies a famous page in history from the success with which she withstood the Spanish siege in 1573. Leyden and Haarlem, after a most heroic defence, had each fallen, and their inhabitants been put to the sword. Alkmaar, therefore, might well feel discouraged; yet she did not hesitate to stand by the cause of William of Orange and of freedom. The city was invested so closely by the Duke of Alva that, as he himself said, "not even a sparrow could escape." After a cannonade of nearly twelve hours the Spaniards rushed to the



THE WEIGH-HOUSE AT ALKMAAR.
Date on façade, 1582 : renovatum, 1884.

assault. Every man in Alkmaar, who could walk, turned soldier. The women and children, heedless of the balls flying in all directions, passed steadily to and fro, carrying to their fathers, husbands, and brothers fresh supplies of powder and ball.

As the Spaniards attempted to scale the walls they were received with boiling water, pitch and oil, molten lead, and unslacked lime. Hundreds of tarred and burning hoops were skilfully quoited round the necks of the Spanish soldiers, who vainly endeavoured to free themselves from these fiery ruffs.

Three such assaults took place, and the siege had lasted seven weeks when the Prince of Orange sent a message to the governor of the province to cut the dykes. The message was courageously carried by a carpenter in a hollow staff, which staff he somehow dropped one day in his flight when chased by the Spaniards. He escaped and delivered the message verbally, and the inundation commenced.

The staff, and the letter it contained, were taken to Don Frederick, son of the Duke of Alva, who was in command, and from fear of being drowned, he raised the siege, and retired with his army. This was the first defeat the Spaniards sustained, and is therefore an additional glory to Alkmaar.

The public Weighing-house is a picturesque building. It dates from 1582, and has a richly decorated front. Some 5,000 tons of the round Dutch cheeses, called Edam cheeses, are annually weighed off here—about half the produce of the province. Nearly all the remainder, as we have already seen, is marketed at Hoorn, and now-a-days very little, comparatively speaking, at Edam, although it gives its name to the cheese.

When Edward IV. of England was compelled by Warwick, the "king-maker," to fly from his kingdom, he crossed the North Sea to Holland, and took refuge in Alkmaar until restored to his throne. The place has therefore an additional interest for us.

ENKHUIZEN.

We went out now into the Zuider Zee again, and sailed for Enkhuizen, once from its geographical position and its power the key of the Zuider Zee, whose harbour formerly accommodated somewhere about a thousand ships, but is now greatly silted up, and has only a few fishing vessels.

This port of Enkhuizen, you will remember, combined with Hoorn and Monnikendam in sending out the ships which in 1576 took the Spanish admiral de Bossu prisoner, and destroyed the Spanish fleet with which he attempted to obtain the mastery of the Zuider Zee. The admiral's two-handed sword is preserved here at Enkhuizen, and, as we have already seen, his drinking cup is at Hoorn, and his collar of the Golden Fleece at Monnikendam.

A prominent object from the Zuider Zee is the Water Tower. It is known as the Dromedary Tower. I could not learn why it received this name.

We now entered the harbour and the canals of the town. In 1572, the year before the siege of Alkmaar, the Duke of Alva endeavoured to quarter a garrison of Spanish soldiers at Enkhuizen, because she commands the entrance to the Zuider Zee; but the burghers kept the gates firmly closed, forced back the Spanish soldiers, and took their commander prisoner. The

burghers then hoisted the standard of the Prince of Orange, and declared themselves under his government.

Later in the same year, after the sack of Naarden by the Spaniards, William of Orange, with only some 70 horsemen, was escorted across the Zuider Zee from Kampen to Enkhuizen here, where there were always warm and faithful hearts to receive him, whether he came unsuccessful or as a conqueror.

At the time of her prosperity Enkhuizen had a population of 40,000; now there are only 5,000. Enkhuizen then, after Edam, is become one of the most dead of the dead cities. The decay of Enkhuizen is the more deplorable when we remember that she was one of the most influential cities of Holland, and that it was she who first hoisted the standard of liberty against the tyranny of Spain.

The causes which I named at the outset have operated very strongly against Enkhuizen, with the result that when her trade to the Indies stopped, and her herring fishery dwindled away, whole streets were demolished or deserted, and now trees wave over the forsaken canals, where lines of houses stood. Enkhuizen means "few houses," "*Enkele huizen*," and the significance of the name has indeed returned to the place. Amid these sad reflections, I was delighted to see the bonny, bright pretty faces of many of the school children. To-day, Enkhuizen is nothing more than a small agricultural market town, with a little Zuider Zee fishing. Its chief point of vitality is the railway station quay, whence the ferry steamboat plies across the Zuider Zee to Friesland. This, too, was the birthplace of the painter Paul Potter.

In winter time, when the canals are frozen over, boats are exchanged for skates. Market people skate to market, the labourer to his work, and the shopkeeper to his shop. Many peasants skate from one city to another. Sometimes you see a human figure pass you on the canal like an arrow; it is a peasant girl carrying milk to some house in the town. The winter of 1788 was of unusual severity, and the ice on the Zuider Zee bore right across to the Frisian coast.

STAVOREN.

We now sailed across the Zuider Zee to Stavoren on the Friesland shore. You will remember the temple erected here to Stavo or Jupiter, by Friso and his brothers.

The waves of the Zuider Zee break against the protecting dyke with great force. We saw the roofs and steeple of Stavoren peeping over the dyke, and wondered how far down below the level of the water the streets and the people were on the other side. This dyke, a bulwark of earth, and wood, and granite, stretches away to the horizon, further than the eye can see, and

is a striking testimony to the indomitable courage and perseverance of the Dutch.

Stavoren is now a village of only 700 inhabitants, but it was a large and populous city before Amsterdam existed. Stavoren reached the summit of her prosperity in the thirteenth century, and gold was then so plentiful in Stavoren that even the weather-cocks were made of solid gold. The decadence of Stavoren is chiefly due to the formation of a great sandbank blocking the entrance to the port.

An old legend relates that the wife of a rich merchant ordered one of her husband's captains to bring her a cargo of "the most precious thing in the world." He brought her a cargo of wheat, as the mainstay of life, but she was so enraged that she ordered him to cast his cargo into the sea. He obeyed, and, says the legend, God was so angry at this wanton waste, that the cargo was turned into a sandbank, and brought about the ruin of the wealthy city. The sandbank is known to this day as the "Vrouwen-sand," or "Woman's-sandbank." A poem has been written by Margaret J. Preston, called the "Lady Riberta's Harvest," for that was the accredited name of the rich merchant's wife. The last stanza runs thus:—

The Lady Riberta's ships went down
In the offing; the city's old renown
Faded and fled with its commerce dead,
And the Lady Riberta begged for bread.
The hungry billows with rage and roar
Have broken the ancient barriers o'er
And bitten their way into the shore,
And where such traffic was wont to be
The voyager now can only see
The spume and fret of the Zuider Zee.

FRIESLAND.

Friesland is especially a milk, butter, and cheese province, and we went to see a Friesland farmhouse. Friesland has been described as the "Paradise of cows." The cows of Friesland—indeed all Dutch cows generally speaking are splendid creatures, are invariably black and white, it is very rarely indeed that you see a brown cow, or one of any other colour. In many districts they yield as much as seven gallons of milk a day. It is, I believe, to Dutch stock that our shorthorns trace their pedigree. A great pyramidal roof covers the whole of the farm buildings, which we in England are accustomed to see distinct from the house. There is only one floor. The windows of the living and sleeping rooms are to the front. Behind, separated only by a passage, are the shippon and stable, all under one roof, as is also the dairy. There is one parlour, or state-room, which is very seldom used, in which we were offered by the farmeress, the curious, but usual, combination of new milk and cigars. Under

the lofty roof, and covering the whole area of the building is the hayloft. Everything is kept in the most astonishing order and cleanliness, even to exaggeration.

The interior of a Friesland kitchen is curious. The chimney-shaft comes down to the floor right in the middle of the kitchen. Up to the chimney-shaft is a large trough of clean water. The stove is at the left side of the chimney-shaft facing the window, and beyond that is a dresser. The whole kitchen seems to be very different to our English arrangements.

The dress of the Friesland vrouws is characteristic. Over a black silk cap fitting close to the head is placed a gold or silver helmet, or casque. The metal is so thin that the casque fits close to the shape of the head. As the women walk along, the sunlight glances off these brightly-shining casques, giving their wearers a strangely warrior-like appearance. Sometimes the casques are covered with lace, but even then the glittering helmet shines through. According to a doubtful tradition, these helmets were introduced to protect the woman's head, when the husband paid too much attention to the bottle, as the old Dutchmen were wont to do. Some municipalities endeavoured to stop this condition of things by fining the husband a ham each time he beat his wife, but the woman was fined two hams if she beat her husband.

There is a curious Friesland betrothal custom. When a young man seeks the hand of a girl, if she leaves the room, and returns immediately wearing her helmet, it is a sign that she consents; but if she does not do this, he knows that a refusal is intended.

On high days and holidays a smart hat or bonnet is worn on the top of the helmet and cap.

HINDELOOPEN.

Our voyage now takes us to Hindeloopen, on the Frisian coast, another decayed Zuider Zee port, once rich and wealthy, but on the day when I was there the little harbour of Hindeloopen was absolutely empty. Indeed, the harbour is now too much silted up to allow any but comparatively small vessels to enter.

Here is the protecting dyke and the lock gates through which you ascend (how curious it sounds!) into the Zuider Zee. Adjoining the gate is the lock-keeper's house with its beacon light. When a gale blows from the north, or north-west, the waves dash furiously against the dyke, the houses rock, and the people of Hindeloopen tremble lest there should be another inundation.

So recently as 1825 the sea burst through the dykes, and a third of Friesland was flooded. A thousand years ago there was

here a forest in which the early kings hunted. The name Hindeloopen is derived from "Hinden-loopen," "stag hunt." That forest was swallowed up when the intrushing waters formed the Zuider Zee.

FRANEKER.

We then turned inland and arrived at Franeker, a clean and well-kept little town, famous for its University, which the Frieslanders founded here in 1585, and endowed with a liberal income, and to which they invited professors from all parts of the world.

The Stadhuis, or Town Hall, of Franeker is a large building. It forms the corner of the street, and has two curious pinnacles, which, as you stand below, add very greatly to the effect of height. The roof is surmounted by an elegant bell-tower.

This Town Hall dates from 1591, and, among other curiosities, contains a Bible printed in 1545, and some silver-gilt goblets of the ancient guilds. For two hundred years the University cast a brilliant light over Franeker, and from here Leyden received some of her most celebrated professors.

In 1773, Eisinga, a simple burgher of Franeker, constructed a clock, which actuates models of the planets of the solar system, all moving at their correct ratio of speed. It is called the "planetarium," and may be seen in a small house under the trees on the right.

LEEWARDEN.

We still continued our way by the canals inland, and arrived at Leeuwarden, the capital of Friesland. You must not think that we are now in a dead city—so far from that, Leeuwarden is a comparatively modern town of 25,000 inhabitants. Although there are many quaint houses and gables, you also find in her busy streets modern shops with plate-glass windows.

The Weigh-house of Leeuwarden is a handsome building. It was built in 1546, and stands in the principal market-place, and adjoins one of the quays.

Flax is much cultivated in this district, but the chief source of the wealth of Friesland is the manufacture of butter and cheese. I had the privilege of visiting a Boter-Fabrick, or butter manufactory, near Leeuwarden, where the milk of a thousand cows is daily churned into butter by machinery driven by a steam engine. Every operation is conducted with extreme cleanliness, and is most interesting. From here the butter and cheese is largely shipped to Hull and Newcastle.

From the number of sailing craft and steam vessels to be seen in the canals here, I think I am justified in describing Leeuwarden as an inland port of Friesland, although we are a long way from the sea.

It is an interesting fact that, on the day of the murder of William of Orange, the Father of his people, the only guest at the family dinner was the Burgomaster of Leeuwarden, whom the prince interrogated as to the political and religious aspect of Friesland. Immediately after that meal, William was struck down by the hand of the hired assassin of Spain.

SNEEK.

Now, sailing a south-westerly course through the Frisian meres, we entered the picturesque harbour of Sneek. We were here right away inland: I therefore call this another inland port of Friesland. From this harbour, canals ramify through and all round the town, forming, so to speak, a moat round the place.

The fine old water-gate is, perhaps, the glory of Sneek. The roadway is carried over a massive bridge, over which is a superstructure containing a clock carried on a graceful double arch. This water-gate was part of the ancient walls, or ramparts. The roadway inclines up to the gate, which stands higher than any other part of the town. The gate thus remained above water in the many inundations with which Sneek has been visited, affording some shelter and protection to the poor people drowned out of their homes.

In 1750 there occurred a disastrous flood. The waters had covered the country for several days, and the neighbouring peasants, driven from their farms and villages, encamped with their families and cattle in the streets and on the quays of this little town.

Let me describe that flood as we pass round the town: In the evening, above the sound of wind and rain, a grinding noise was heard. The dykes of Sneek had burst, and in a few moments there was 5ft. of water in the town. The streets and quays all disappeared under this sudden flood. The cattle, wild with fear, burst their bonds. Men, women, and children, carried away by the torrents which rushed in every direction, were cast into the canal and pitilessly drowned. For several hours the groans and cries of the victims mingled with the howling of the hurricane. Many poor people found refuge on the bridge of the old gate, where they passed a fearful night trying to rescue some of the victims carried away in the current beneath them. A grievous sight met their eyes at daybreak—the bodies of human beings and the carcasses of cattle tossed swiftly along in the swirling current.

In a street in Sneek is a large windmill, a very prominent object, of which there are such immense numbers in Holland. Most of the windmills have thatched roofs and a gallery round the middle. Windmills are very greatly used for pumping, to

keep the water down in the polders, and to prevent its rising in the canals above the proper level. In addition to pumping, they are used for grinding corn, sawing, and indeed, in Holland, windmills do something of almost everything where machinery is required. It is interesting to note that Rembrandt the painter was the son of a miller, and that he was born in a wind-mill at Leyden.

The flat-bottomed Dutch vessels have curious lee-boards at the side. These lee-boards, or *zwaards* as they are called, are lowered down into the water, and give the vessels steadiness in sailing.

To see Sneek to-day, smart, clean, and picturesque, it is difficult to believe that she has witnessed so much distress and suffering.

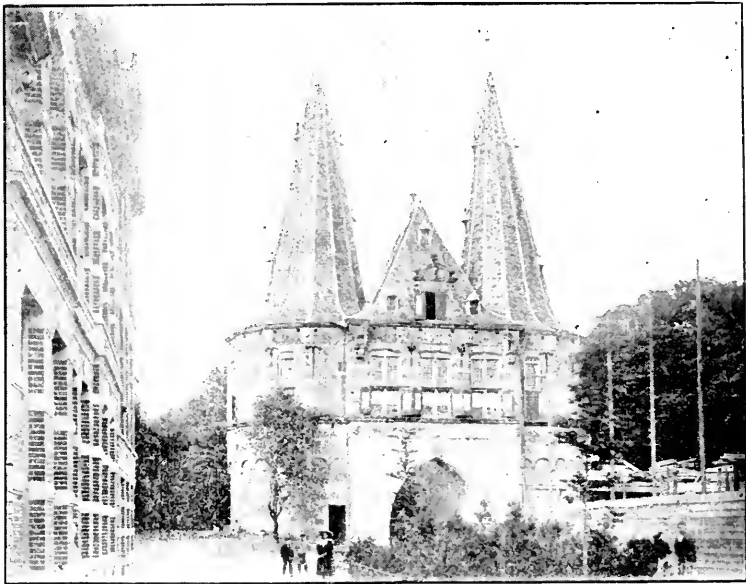
Referring again for a moment to the inundation which I have already described. When daylight broke a strange object was discovered floating in the water, from which proceeded strange, shrill cries. As it came nearer the bridge the cries became more piercing. It was hooked by a daring fisher, and proved to be a cradle, in which were an infant and a cat. The cat by its cries of terror had attracted attention. The baby was sleeping. The town took charge of the baby as an orphan, and started him in life. Do you ask what became of the cat that saved the infant? There history is at fault, and I have found no record.

We now bade farewell to Friesland, and sailed in a south-easterly course to the mouth of the Yssel River. This was our last sail on the *Zuider Zee*, and a somewhat stormy sail we found it, having to make the crockery snug in our beds. At length we made the Yssel all safely, when we lighted the fire, and soon had afternoon tea. In another hour the "*Dolphin*" was moored to the Yssel quay at Kampen, in the province of Over-yssel.

The old town gate stands on the Yssel quay. It is called the Koorn Market gate, because you pass through it to an open space on which the corn market is held. The gate consists of two large, massive towers, with machicoulis and pointed roofs, joined together by an enormous wall, through which is the arched doorway.

Kampen was formerly surrounded by ramparts and towers, which are now gone, and only three gates remain. We visited a second of these gates, called the *Broeders' Poort*, or Brothers' Gate. In an adjoining street there formerly stood a convent for monks under age, hence the name—*Brothers' Gate*. It has four pointed belfries, two on each side, and the gateway is throughout a very massive pile of building. Passing through the gate we found ourselves on the old ramparts, now converted into a public garden or park.

Walking under the trees, we come to the remaining third of the old town gates. It dates from the sixteenth century, and is therefore about a hundred years older than the gate we have just left. It is known as the Cellebroeders' Poort. The Cellebroeders were a greatly venerated order of monks, who had everything in common. Their name is thought to be a corruption of "*Fratres communis vitae*." Their convent adjoined this gate, hence the name. This gateway, with its lofty, pointed towers, is a beautiful specimen of mediæval architecture, and the town of Kampen is to be congratulated upon the care with which these relics of old time fortifications are preserved.



THE CELLEBROEDERS' POORT AT KAMPEN, OVERTSSEL.

A story is told of one of the bygone functionaries of Kampen, who found that the tolls exacted on the entrance of goods averaged 10,000 florins for each gate. This worthy then proposed that the number of gates should be doubled, and so double the income of the town. Needless to say, the Kampeners did not see the force of acting upon this suggestion.

Kampen is not a dead city; in fact, we have now left the dead cities behind. Nevertheless, Kampen has a history, and has enjoyed municipal privileges since the year 1300. As the burghers prospered they devoted their increasing wealth to the

providing for and the relieving the people of taxation. Kampen is therefore now a free town, the port is likewise free, so shipping and commerce flock to this place, as do also many people retiring into private life, and who wish to live economically.

The Stadhuis, or Town Hall, is perhaps the jewel of Kampen. It dates from 1543, and is full of archæological interest. It is very quaint in appearance. There are tourelles at the upper corners of the building, a spirally twisted chimney passing up outside the gable, and a bellry tower leaning over to the left. There is a peculiar projection of iron bars from one of the side windows of the building. I can only describe it as an iron cage, for in it prisoners were exposed to the public gaze, as a warning to evil doers. Now let us enter the building.

Ranged in beautiful order along the walls, are the standards, halberds, pikes, and hooks used to draw fighting ships together of the seventeenth century, also the syringes for boiling oil or water. But our attention is riveted by the magnificent chimney-piece. Two caryatides support a carved entablature, the frieze of which is divided into two equal parts, that on the left is a bas-relief, representing the Judgment of Solomon, that on the right, Mucius Sævola placing his hand in the burning brazier, to prove his fortitude.

Above are four niches; in the extreme left niche a statue of Truth, and in the extreme right, a statue of Faith. In the two central niches are heraldic lions, bearing in their paws standards of the city arms. To the right of the fireplace is the judgment seat, before which criminals were brought. The seat is carved, and has a canopy carried by pillars, the wood of which is so black with age as to be scarcely visible. Leading out of one of the windows of this room is the iron cage which we saw from the outside just now, and in which prisoners were exposed.

At the Church of St. Nicholas, here in Kampen, lies buried the body of the Count of Hoorn, so treacherously beheaded by the Duke of Alva. A bridge was here erected twenty-five years ago (in 1872) over the Yssel at Kampen. It is a splendid engineering work, and, like everything else at Kampen, is free.

Wishing to pass through on our voyage up the Yssel, we hailed the bridge, and the centre was raised while the "Dolphin" sailed through, for the time being blocking the road traffic passing over. The Yssel is here 328 yards wide. The broad rivers of Holland are spanned by numerous fine bridges, many of them of the lattice girder type; all, from the great width of the rivers, magnificent examples of engineering skill.

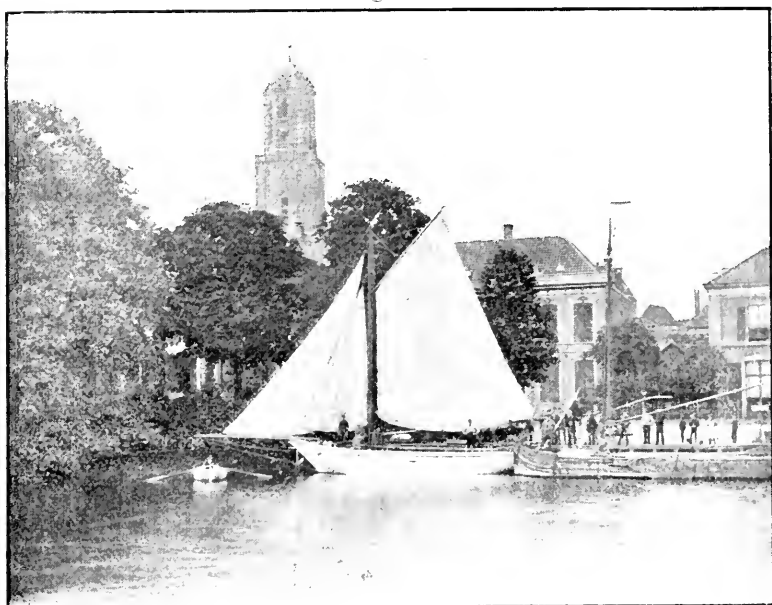
ZWOLLE.

A few hours' sail up the Yssel, and then turning for about two miles up what is known as Willem's Canal, we arrive at

Zwolle, the capital of Overijssel, or to use the lines of Bishop Huet—

 next to Zwolle we went
Where his long life good Kempis spent.
And still his pious fame survives,
And in his grateful country lives.

This in allusion to Thomas à Kempis, who lived in the little monastery of St. Agnes, near this place, and there died in his 93rd year. Thomas à Kempis is the reputed author of the famous work, the "Imitation of Christ."



THE YACHT "DOLPHIN" AT ZWOLLE, OVERISSEL.
Tower of the Catholic Church beyond.

We found a delightful mooring place at Zwolle. We had some heavy rain during the day's voyage up the Yssel, and were glad to spread our sails out to dry in the sunshine.

This water is known as the Zwarte Water, or "Black Water," a small river which empties into the Zuider Zee. Zwolle is surrounded by gardens and trees, and there is a charming walk along the river bank.

In addition to inundations, from which Zwolle, like other Dutch towns, has greatly suffered, she fell terribly a victim in the early middle ages to pestilential diseases.

We read that, in 1398, the plague, called "peste noire" or "black sickness," devastated this poor city, carrying off victims at the rate of eighty a day, a large proportion of the then population. The summer of 1422 was nearly as fatal, and sufficient gravediggers to bury the dead could not be found. In 1655 the epidemic reappeared with such violence that there were not sufficient lawyers to draw up the wills and bequests of the dying.

Since 1661, however, Zwolle has vindicated her right to be placed on the list of healthy cities. To enter the city we cross over the Zwarte Water by the iron drawbridge, which, although so light looking, is of great strength. We then pass through a picturesque old gateway, called the Sassenpoort.

Zwolle, now a prosperous town of 20,000 inhabitants, was formerly walled and fortified, and had nine entrances. The ancient walls and gates are all destroyed, excepting the one gateway, the Sassenpoort. We are immediately struck with the great height to which this old gate rises above the surrounding buildings. The Sassenpoort consists of four octagonal towers, surmounted by lofty spires. In the centre of the four spires rises a bell turret. This sometimes furnishes material for a little joke upon strangers to the lively people of Zwolle. They say that the Sassenpoort "*possède cinq tours et quatre sans cloches*," which, of course, means that the Sassenpoort "possesses five towers and four without bells," but by a play upon the words "sans" and "cent" it might be interpreted that the Sassenpoort "possesses five towers and four hundred bells."

In 1787, when the Duke of Brunswick marched through Overijssel to the assistance of the Prince of Orange, he occupied Zwolle without resistance by a detachment of 600 cavalry, and all communication with the outer world was stopped until the flag of Orange was hoisted upon the towers of Zwolle.

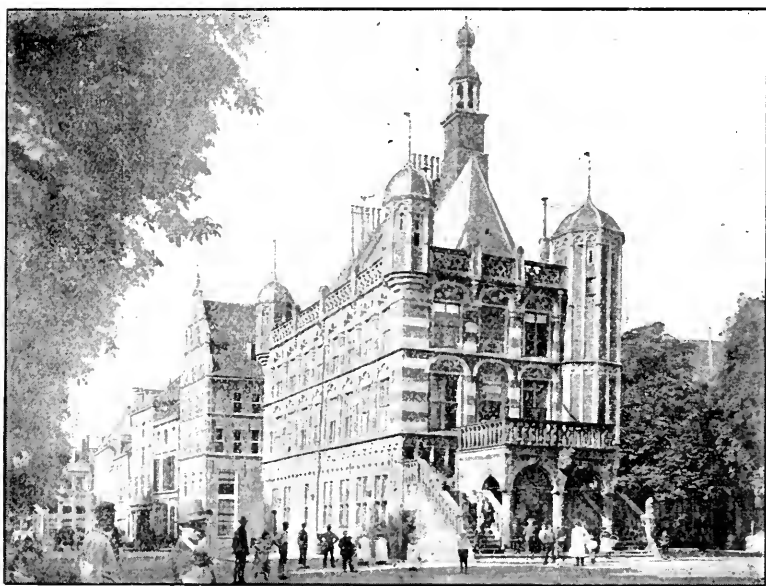
DEVENTER.

We now sailed out on to the Yssel again, and after going some twenty miles up the river we arrived at Deventer, the last town in the province of Overijssel, and close to the border of Guelderland. Deventer is an ancient city, and is said to derive its name from one Davon, a powerful, learned, and respected man, who built a castle here in the eighth century.

To-day Deventer is a city of narrow streets and old-fashioned houses; but the market place is a wide, open space, and contains a handsome building, the Weigh-house. It was built in 1528, and the staircase and double balustrades were added in 1643.

In olden times this Weigh-house was the exchange or meeting-place of the business men of Deventer; and their business was of no mean importance, for Deventer was attached to the Hanseatic League, and ranked in the sixteenth century as the third city in the Netherlands, after Antwerp and Amsterdam. Although this traffic is now gone, Deventer still does a considerable trade on the Yssel in the transit of goods to Germany. In Deventer, too, carpets in imitation of Persian are made.

Deventer is renowned all over Holland for a special make of cake, a sort of spiced gingerbread, and a public official is appointed to see that the proper ingredients are used to maintain



THE WEIGH-HOUSE AT DEVENTER, OVERYSSEL.

its reputation. Deventer has an enormous church, the earlier portion of which dates from 1040. The church is dedicated to St. Lebwin, who was a friend of Davon, the founder of the city. The church has been added to at various times, and the huge massive belfry only dates from 1613. Some houses are built up to the wall of the church, and one of them is an inn.

Externally the church has a somewhat plain appearance, but the interior is handsome and gives you an idea of the extent of the church. It is still considered one of the finest churches in the Low Countries. Formerly the walls were adorned with

frescoes and paintings, but these were covered with whitewash at the time of the Reformation.

While in the peaceful quiet of this church, it may be interesting to mention a curious betrothal custom. A young man and young woman meet at the "Kirmess" or annual village fair, and he subsequently finds that she occupies the greater part of his thoughts; so one evening he puts on his best coat and goes to the girl's home. He is welcomed by the father and mother, but no one refers to the object of his visit, though the young people of the family may nudge one another. If the girl in question lets the fire go out, it is a sign that she won't have the young man, and he has nothing else to do but open the door and walk away; but if she puts fuel on the fire, it is a sign that all is right, and from that day the young man is treated as if he belonged to the family.

The vaulting of this church dates from the fifteenth century. The crypt is the oldest part of the church. This crypt is under the chancel or choir, and the pillars supporting the church above are channeled and twisted columns, with the spirals running in contrary directions. These columns, though massive, are very graceful.

It is interesting to note, in passing, that, in 1568, the Duke of Alva concentrated his forces here in Deventer, with a view to the annihilation of the forces of the Prince of Orange in Friesland, and that Alva was here himself in person to superintend their operations.

Twenty-three years later, in 1591, the Spanish governor surrendered Deventer to Prince Maurice of Orange.

ZUTPHEN.

We then continued our voyage up the Yssel, and entered the province of Guelderland, coming to the ancient city of Zutphen, formerly a member of the Hanseatic League, but whose commerce has now much declined. It is a beautiful city, and many Dutchmen who have retired home with a fortune from the Netherlands India take up their abode at Zutphen.

The Groote Kerk, or the cathedral church of St. Walburgh's, dates from the twelfth century. What a curious pile of building it is!

The original tower was destroyed by lightning in 1600; the present tower, which can be seen for miles on the river, was afterwards added. Zutphen suffered from the same disasters which befell other Dutch towns between the fifteenth and seventeenth centuries—sieges, assaults, massacres, and devastations, by turns. In 1672, after five days' cannonading, the Duke of Orleans carried Zutphen by assault. The French artillery officers laid an "embargo" upon the bells of Zutphen, and demanded 10,000

crowns as the price at which they might be redeemed. The burgomasters offered half, and when this was declined they volunteered to write to De Louvois, the minister of Louis XIV., at Paris. The Duke of Orleans, who knew the dreaded minister, regarded this proposal as one of extreme audacity, and told the burgomasters that "it was no use, and that they would lose their bells into the bargain." Nothing daunted, the burgomasters wrote, and, to their great astonishment, received a letter from De Louvois, which is preserved in the archives of Zutphen—

"Messieurs,—J'ay receu la lettre que vous m'avez escrite, par laquelle vous me faites connoistre l'impuissance dans laquelle vous estes de payer dix mil escus, pour les droitz que les officiers d'artillerie ont sur vos cloches. J'en ay rendu compte au Roy, et sa Ma^e a bien voulu modérer cette somme à la moitié.

"Mais apres cela, il faut que vous sortiez promptement de cette affaire.

"Je suis, Messieurs,

"Votre affectionné seruiteur,

"DE LOUVOIS.

"St. Germain, ce X's Aoust 1672.

"Les Bourguemestres de Zutphen."

[*Translation.*]

"Gentlemen,—I have received the letter that you have written, in which you inform me of your inability to pay the 10,000 crowns, the indemnity claimed by the officers of the artillery on your bells. I have submitted the matter to the King, and his majesty is willing to reduce the sum by one-half. But after that, the sooner you settle this affair the better.

"I am, Gentlemen,

"Your affectionate servant,

"DE LOUVOIS.

"St. Germain, X Augst. 1672."

Close by stands the old Water Tower. For centuries these machicolated battlements and tall spires have looked down upon the vicissitudes of Zutphen. As each window has iron bars before it, the tower at some period probably did duty as a prison.

In 1586, Leicester, with the combined Dutch and English army, determined to take Zutphen from the Spaniards, and set about the siege of the place. The Spanish Governor-General, the Duke of Parma, desiring to throw provisions into the city, sent out a convoy for that purpose. An English detachment of 2,000 musketeers and 300 cavalry, under the command of that flower of English chivalry, and favourite of Queen Elizabeth, Sir

Philip Sidney, left Zutphen to cut off the convoy. The English attacked vigorously, but in the engagement the leg of Sir Philip Sidney was shattered by a ball. He lingered about three weeks and then died. Thus, in this comparatively unimportant engagement did that noble spirit, the hope and pride of the English army, receive his death blow.

You all remember the story that when Sir Philip Sidney lay on the battle-field of Zutphen, in pain, faint, and exhausted from loss of blood, he refused a cup of water which was brought to him, and insisted that it should be given to a private soldier who lay near him, and whose sufferings, Sidney said, were more severe than his own. May I quote a few lines by Charlotte F. Bates?—

The height of Sidney's deed upon this field
Rises so high that all the world can see ;
Self-abnegating grace has here revealed
How God-like in his suffering man may be.

What blessed immortality he quaffed,
When all his parching agonies denied,
From his own lips he sent the untouched draught,
To him who likewise languished at his side !

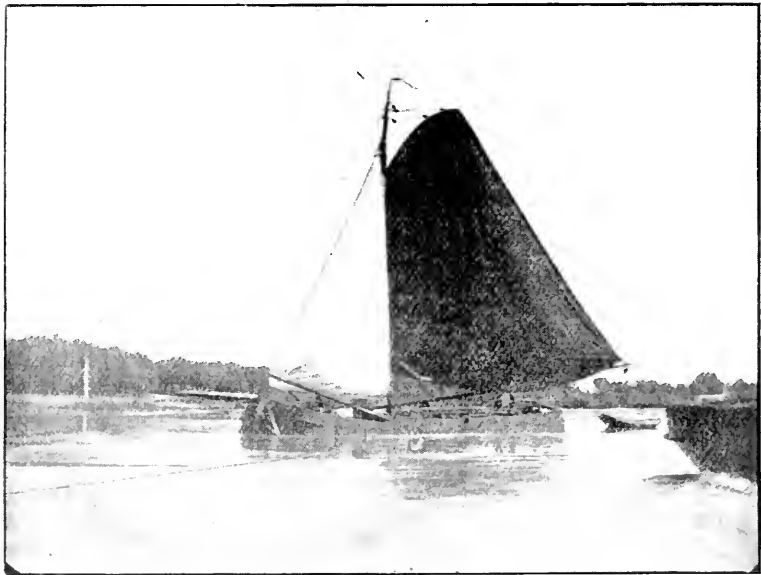
Arcadia's beauty still is fresh to-day,
And knightly fame that charmed the Virgin Queen ;
But Zutphen lifts him higher still than they,
And gives his memory the brightest green !

The little haven of Zutphen, where the vessels passing up and down the Yssel, and having business at Zutphen, turn in and discharge, or take in, their cargoes, is a very pretty spot.

Bidding good-bye to Zutphen, we hoist sail, and out again on our voyage up the Yssel. Let us consider a moment the phase of life on these Dutch waters. The usual style of Dutch craft is called a *tjalk*, and is eminently adapted for the navigation of the shallow waters of the *Zuider Zee*, and the canals and rivers of Holland. These vessels have no keels, but have at the sides lee-boards, called *zwaards*, which are lowered in the water to give them steadiness. These *tjalks* seem to be easily handled ; they can spread a large surface of canvas, and can sail very close to the wind. We met one particular *tjalk* which had a white foresail and red mainsail, which is shown in the engraving. They have very bluff bows, and no great speed, the *Dolphin* could easily pass them, but a *tjalk* could go where the yacht, owing to its deep keel, could not. These vessels carry a large amount of cargo and the living accommodation is all in the stern.

A boatman marries and sets up a *tjalk*—it becomes their floating home, they have no other ; their family is born on board, is brought up, and is married off on to other *tjalks*, or perhaps, to begin with, a smaller vessel of the same species known as a *praam*.

These Dutch boat-people are thus quite an aquatic or amphibious race. They earn their living carrying cargoes to market, or to the ocean-going steamers at the seaport. Everything is beautifully clean, and the skippers' families are generally people of the greatest respectability. Among the many incidents of domestic life which we saw on board these tjalks, this is one. The skipper's daughter has just brought their breakfast cups out of the cabin and is washing up. Her pantry-sink is a wooden box which hooks on to the gunwale of the tjalk—a simple device but very practical. Cups,



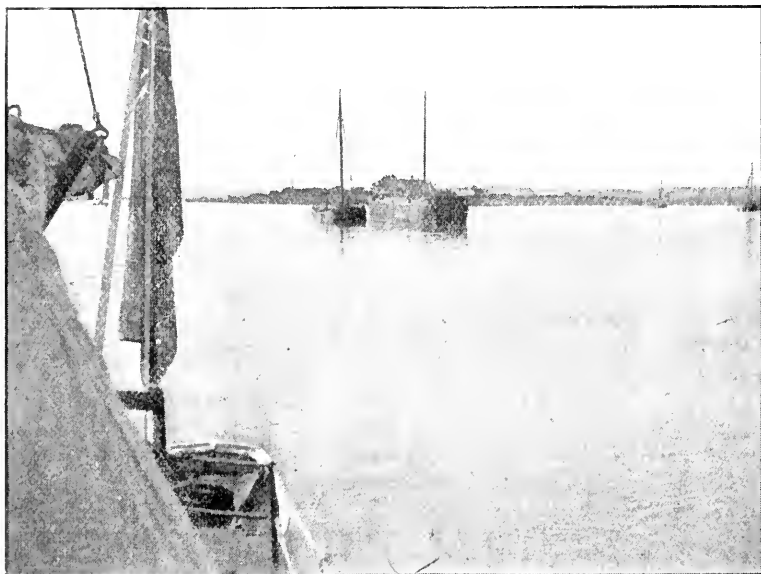
TJALK ON THE YSSEL.

spoons, and so forth remain in this sink, while the washing water falls into the river.

The skippers of these tjalks have hitherto done fairly well in their business and become prosperous, but of recent years their trade has been largely cut into by companies or syndicates, who have built huge iron lighters, with hulls on similar lines to those of the Dutch tjalks. These great iron tjalks or lighters do not sail at all, but when loaded are towed by a steam tug up the Rhine into Germany, or *vice versâ*. It is the old story—a greater tonnage more expeditiously conveyed, and with less hands. Commercially, they are no doubt more profitable, but

they are not so picturesque as the older Dutch sailing tjalks. We did not find it all plain sailing on the Yssel. The whole of our voyage up the river was of course against stream, and there is a considerable stream running. During our last day on the Yssel the wind was also against us. The stream was too strong for us to make progress by tacking; what ground we made on one tack was lost when we came to 'bout ship. We had therefore to requisition the assistance of a passing tug boat.

It was one of the class of steam tugs which tows the great iron lighters up the Rhine into Germany. This mode of pro-



JUNCTION OF RHINE AND YSSEL, FROM THE DECK OF THE DOLPHIN.

gression was pleasant enough until the stoker of the tug fired up; thick volumes of smoke came from the funnel, and the spotless deck of the Dolphin was unpleasantly covered with blacks.

We had now been voyaging for several days up the Yssel, and in doing so had visited four large cities, viz., Kampen, Zwolle, Deventer, and Zutphen, and passed numerous smaller towns and villages, whose church towers formed picturesque objects in the moving panorama. We now arrived at the junction of the Rhine and Yssel, or rather the spot where Yssel branches out of the Rhine.

THE RHINE.

We are now on the Rhine, which is of great width, being fully a mile wide. Away to the right the Yssel turns off, on its way to the Zuider Zee, and is the route by which we are just arrived; while away to the left the main Rhine continues its course westerly to the North Sea.

As we were not going into Germany we swung round here, and went down the Rhine to the left; we had hitherto been coming up stream from the right, the Yssel. About three miles after leaving the junction with the Yssel, on our passage down the Rhine, we arrived at Arnhem, a very ancient city, the *Arenacum* of the Romans.

ARNHEM.

In 1343 Arnhem entered the Hanseatic League, and in 1377 was recognised as a Rhine port. Arnhem had then a population of 46,000. When Louis XIV. invaded Holland in 1672, the then Prince of Orange waited here in Arnhem with his army to prevent the French crossing the Rhine, but they were too smart for him, for making a detour, the French effected the passage of the Yssel, and threatened Arnhem from the land side. The Prince of Orange, being then caught between the French army and the broad Rhine, found the position untenable, and abandoned Arnhem to the enemy.

We soon found ourselves in the market square of Arnhem, where we saw the market carts, with their white covers, all around us. Before us rose the *Groote Kerk*, or cathedral church of St. Eusebius. This church is chiefly remarkable for its lofty tower, which is no less than 310ft. high. The church dates from 1452, and contains a very interesting tomb. It is that of Charles of Egmont, the last Duke of Gueldres, who spent his life in the constant effort to withstand the aggressions of the Emperor Charles V. The figure of Egmont in white marble reposes on the tomb, and is surrounded by six lions holding the family arms. In the words of a writer: "In 1538, bowed down by old age, vanquished, humiliated, his last hope gone of reconquering the duchy he had conquered, lost, and fought for, during half a century, Charles Count Egmont found here that repose he had never known during life."

About 20ft. overhead, placed in what might be termed a cage, is another life-size statue of this Count of Egmont, clad in armour, and in a kneeling attitude. The effect of this kneeling figure, so far above our heads, is very strange.

We now visited the Castle of Roosendal, charmingly situated on the outskirts of Arnhem. This castle has been in the possession of the family for several centuries, the present owner

being the Baron Pallent van Roosendal. The castle has been modernised by two wings, one stretching away to the back, and the other away to the left of the round tower, the old battlements having been removed to make way for them.

When modern artillery came into vogue, those old walls were of no further use, and the castle was turned into a country house. The round tower is therefore the most ancient part of the building, and is about a thousand years old. This castle has played a part in history. Let us recall one or two incidents as we pass through the grounds.

In 1361, Renaud, Duke of Gueldres, was imprisoned by his unnatural brother in this round tower, and for ten years was kept in a dungeon formed in the thickness of the wall, and lighted by a small grated window. It was difficult for a man of ordinary size to move in it. When the duke was at last set free, it was found that he had lost the use of his limbs, and the narrow doorways had to be broken away before he could be carried out. It is horrible to think that human cruelty could confine a fellow creature in such a hole for so long a time. The whole history recalls Anthony Hope's story of "The Prisoner of Zenda."

William III., of England, several times stayed at this castle of Roosendal, not ungratefully remembering the friends and companions who had helped and assisted him when he was but Prince of Orange.

Arnhem is situated in a beautifully timbered, undulating stretch of country; compared with the flat, low-lying land we have visited in North Holland and Friesland, the hills round Arnhem seem relatively high, and we can understand why the district round Arnhem has been called the "Dutch Switzerland." Time did not allow us to stay long at Arnhem, and we had to continue our voyage.

As we sail down the Rhine, we occasionally overtake and pass a remarkable object, a huge timber raft, composed entirely of trunks of trees.

Timber, cut down in the Black Forest or Switzerland, finds its way to the Rhine, and is floated down to, perhaps, Mannheim or Kastel, where it is massed together into a huge raft such as this.

A small wooden house is erected on the raft for the shelter and accommodation of the men, of whom there are a considerable number on a large raft. They are provided with boat-hooks and quanting poles, with which they keep the raft free from contact with objects in the river. Each man has his station, and in stormy weather they sometimes find it a difficult task to keep the raft well braced together. The raft floats down the stream, or is gently towed on its long journey into Holland. These rafts go principally to Dordrecht, and such

timber as is not required in Holland is shipped to foreign countries. A single raft sometimes produces £30,000 when the timber is sold.

In order to get from this arm of the Rhine to the Maas, by which name the Meuse is known when it enters Holland, we had to pass southwards by the Zederik Canal, which joins the Maas at the city of Gorinchem, a name often corrupted down to Gorkum.

This place, Gorinchem, has frequently figured in the annals of Dutch history since the year 1300, perhaps the most important record being that Gorinchem was one of the first towns taken from the Spaniards by the Dutch people in 1572, at the period of that glorious struggle when they threw off the Spanish yoke and gained their civil and religious liberty. The Dutchmen, sad to say, tarnished their victory here by the murder of nineteen Catholic priests and friars, and the Romish calendar still marks the anniversary of the "martyrs of Gorkum."

To get into the river out of the Zederik Canal we had to rise up in a large lock to the river level. How curious it sounds to English ears—rising up to a river! We need always to remind ourselves that were it not for the dykes we should be inundated. As the water slowly rises in the lock we have time to notice a familiar Dutch object, the windmill, which is entirely covered with thatch, and that this particular mill is a sawmill. This windmill bears the date 1827 on the axle of its sails. The mills are generally much larger than we are accustomed to see in England, the length of the sails varying from 80ft. to 120ft. I have already mentioned that windmills are largely used for pumping to control the water levels. It is found that a windmill cannot advantageously raise water more than about $3\frac{1}{4}$ ft.; it is, therefore, not uncommon to find, when water has to be raised any height, a series of windmills each lifting the water a stage higher.

The water in the lock is now raised to the level of the river, and we pass out through the lock-gates. We are at once struck with the vast area of water before us. At this point the River Maas receives the waters of the Waal, the lower arm of the Rhine. The Waal is some 860 yards wide where it joins the Maas, in itself an equally broad river, and the combined rivers present an immense width of water. In severe winters the Maas is sometimes frozen over, and you will remember that I told you at the outset how the army of Bonaparte was able to march upon the surface of the river to the taking of Dordrecht.

This freezing over is an element of great danger to the surrounding districts, for De Amicis tells us that "the current which comes from warmer regions bursts from beneath the ice, and piles it against the dykes in immense masses, thus arresting the course of the water and making it overflow; then begins a

strange battle. To the threats of the Maas, the Hollanders reply with cannon, and charges of grapeshot break the towers and barricades of ice which choke the current." The river again flows freely, and the land is saved.

DORDRECHT.

We are now sailing with wind and stream down the Maas, and to quote the lines of Bishop Huet, we—

 soon with joy at Dort arrive,
Where Maese and Waal unite to drive
With kindred streams invading foes
And every bold attack oppose.

Dort, which is short for Dordrecht, is the most ancient city of Holland. It was founded in 1015, and became and long remained the capital, and has always held the first rank in the assembly of the States.

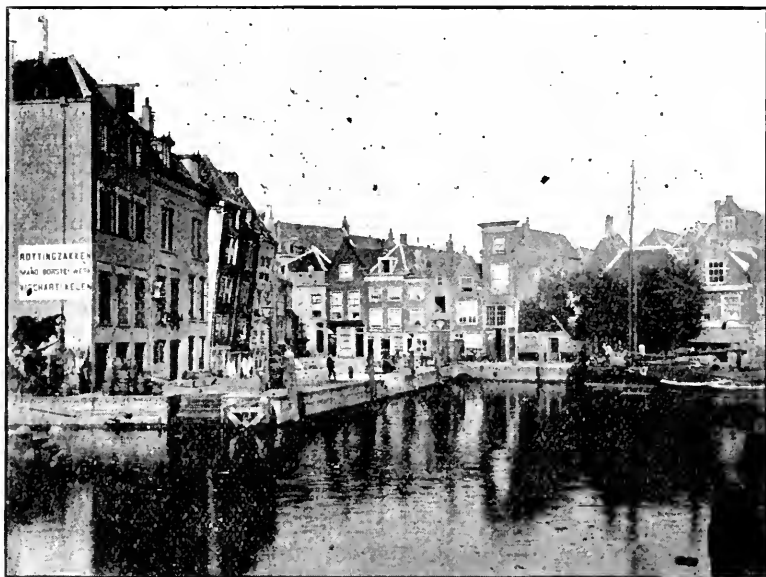
The geographical position of Dordrecht near the mouth of the Maas enabled her to levy tolls on the steam traffic continually passing to and from the Rhine. These tolls cost Dordrecht some fighting and bloodshed to maintain, but they led to the warehousing of goods here, and Dordrecht became in the fourteenth and fifteenth centuries, the principal commercial city of Holland. Subsequently Dordrecht had to yield her superiority to Rotterdam and Amsterdam.

We passed from the Maas through a lock gate, and we were soon in the inner harbour of Dordrecht. The irregular gables and red tiled roofs of unequal height combine to produce a very picturesque effect. Many of the house fronts are out of the perpendicular, and government officials are appointed to examine and report annually as to their safety. One particular house, though greatly leaning over, is known as the "safest house in Dort." In 1285, a marriage was arranged between Elizabeth, daughter of Edward I. of England, and the son of Florens V. Count of Holland. Edward gave his daughter a dowry of some £9,000, and the Count of about £1,093. This alliance was very advantageous to Dutch Commerce, and led to her wool trade with England being centred here in Dordrecht.

Following the Wijn Straat, a street parallel to the harbour, we came to the Wijn Straat Plein. Like other Dutch towns, Dordrecht is permeated with water. The canal comes right up to this square. From the way in which each side of the canal is lined with houses, each of which has its stairs or little landing stage, we might with truth call it Water Street. In the centre of the square is a statue of Ary Scheffer, the painter, who was born in Dordrecht in 1795. Mezzera, who designed the statue, refused any remuneration for this tribute to his friend.

In 1672, deputies from the nobles, and from the towns of Dordrecht, Haarlem, Gorinchem, Alkmaar, Hoorn, Enkhuizen, Monnikendam, and other large centres, met in assembly for the first time, here, at Dordrecht. They made it evident that they would never again return to the dominion of Spain, and appointed the Prince of Orange, their great prince and hero, Stadtholder, Captain-general and Admiral of Holland.

Wherever we turn in Dordrecht, a conspicuous object is the lofty square tower of the Groote Kerk. It is nearly 600 years old, dating from 1339. The tower is surmounted by a large clock, the figures of which can be read at a long distance, as you



THE INNER HARBOUR, DORDRECHT.

will easily realise when I tell you that the one hand of the clock is considerably taller than a man. A canal separates the church from where we stood, and we were able to form some idea of the height of the tower by comparing it with the trees which line the canal, and with the people standing on the bank of the canal. As we walked round to the church we recalled the fact that here, in Dordrecht, was held in 1618, the famous "Synod of Dort," which had 152 sittings, extending over a period of seven months, occupied chiefly in discussing the doctrine of predestination and grace.

At the conclusion of the Synod, the president declared that its miraculous labours "had made hell tremble," but it had the narrow-minded and uncharitable result, that the doctrines of Arminius were condemned, and his adherents were deprived of all civil and sacred offices, and were banished the country. This was one of those quarrels or factions which so largely contributed to the ruin of Holland.

The Groote Kerk is supported by 56 pillars with pointed arches. Four bays of the choir are filled with fine choir stalls. They are of carved oak, the work of John Terwen, of Amsterdam, in 1538, 1539, and 1540. The carvings represent scenes from the Apocalypse, Adam and Eve, Death and the Devil, the entry of Charles V. into Dordrecht, and numerous other subjects. These beautiful stalls show neglect, and appear to be falling into decay. It is a great pity something is not done to preserve them, especially as these choir-stalls are said to be the best in Holland. There is an eighteenth century brass screen separating the choir from the nave.

The spot on which we stood was over the grave of the statesmen brothers De Witt, who were natives of Dordrecht, and who did so much for their country, but who were murdered by an infuriated mob about the year 1672.

We had now reached the last morning of our cruise on the *Dolphin*, and were sailing away from Dordrecht fast down the Maas, westwards, to the coast.

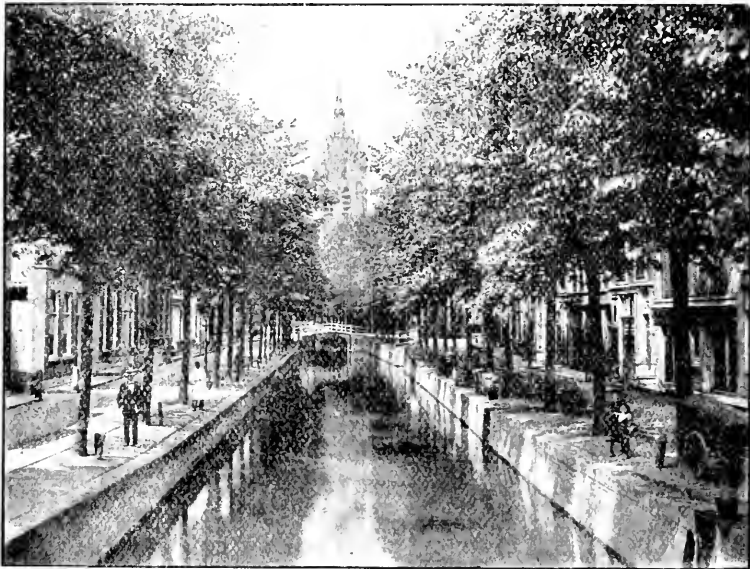
We passed a passenger steamer from Rotterdam, on its way up to Bois-le-duc, or in Dutch with the same meaning, 's Hertogenbosch, which is the name painted on the side of the steamer; the name is colloquially shortened to 's Bosch, and this is the signification of the small s and capital B on the funnel of the steamer.

Wherever we have been during the cruise, we notice the men and boys always smoking—always a cigar or pipe, and very rarely a cigarette. The Dutch, of all nations, perhaps smoke the most. The absence of duty causes tobacco to be cheap, and one is tempted to think that the humidity of the climate makes it almost necessary.

We now bade farewell, with quite a tender feeling of regret, to the *Dolphin*, which, during the weeks she was our home, had borne us in safety for so many, many miles over the waterways of this curious and interesting country. Before leaving Holland, we paid a flying visit to the inland cities of Delft and Haarlem—cities which from earliest times have played a prominent part in their national history. A ditch, or water-canal, used in former times to be vulgarly called a delft; and this city derives its name Delft from the canal cut to it, in ancient times, from the Maas. This canal is the Oude Delft, or old canal, by which name the street on either side is also known.

Delft is a pretty town, and held the third position in rank of the cities of Holland. From the manufacture of pottery, which has flourished here for so long a period, Delft was called the "parent of pottery." The oldest church in Delft is called the Oude Kerk.

In a house facing the canal, and immediately opposite the Oude Kerk, William the Taciturn, Prince of Orange, beloved by the Hollanders as the "father of his people," fell a victim to the hand of the assassin, Balthazar Gerhard, in 1583—the result of the price set on the head of William by his relentless enemy,



DELFT: THE OUDE KERK IN THE DISTANCE.

Philip of Spain. Gerhard waylaid the Prince as he came out from dinner, and fired two pistol-shots at him, point blank.

Philip of Spain, master of an empire which embraced half the world, with riches, armies, glory—a formidable being before whom men prostrated themselves—resorted to an assassin to vanquish William of Orange, who had neither kingdom nor army. But he had what Philip had not, the power of gaining the hearts of men; also one single-minded purpose—the freedom of his beloved country.

There also stands in the Oude Delft a building of red sandstone, with a Gothic façade of the fifteenth century. It was

formerly the Gemeenlandshuis, an old hall in which the first parliament of the Dutch Republic sat. Now-a-days it is the Polytechnic School of Engineering, as Amicis says—"the true military school of engineering, whence issue the officers for the army of defence against the sea." It is here that the young engineers receive instruction in all matters relating to the dykes, dams, and drainage of Holland, here so important a branch of the national service.

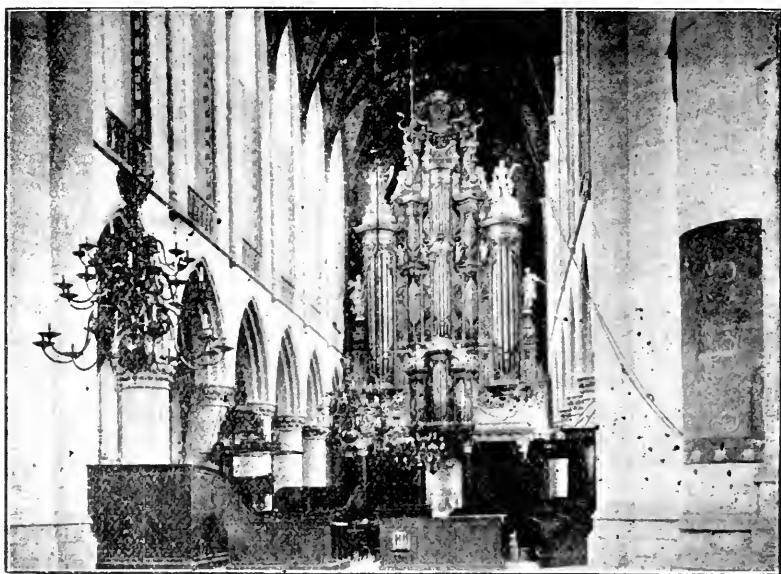
In the Oude Kerk, or Old Church, we pause before the tomb of the famous Admiral Van Tromp, the veteran of thirty-two sea fights. It was this Tromp who, in 1652, scattered the English fleet under Blake at the battle of the Dunes. Van Tromp returned into port with a broom fastened to his masthead, to signify that he had swept the seas of his enemies. He was wounded by a shot in a naval battle with the English in the following year—1653—off the mouth of the Maas. From that wound Tromp died, and this handsome monument was erected to his memory by a grateful country. At the foot of the monument is the recumbent figure of the Admiral in white marble.

We now arrived at Haarlem, the last stage of our journey. Haarlem is an ancient city. Here was born in the fifteenth century Lorenz Koster, for whom the Dutch claim the credit of inventing the art of printing with movable types, and a very interesting story that of Lorenz Koster is. You will find it in several books, notably in Motley's "Rise of the Dutch Republic." Here we are in the centre of the bulb-farming country, and the value of tulips annually produced runs into millions of guilders. The value of a guilder is roundly about one shilling and eight pence. This cultivation of bulbs is really the outcome of an extraordinary craze which swept over Holland in 1637, and is known to history as the "Tulipmania." Haarlem, which has a population of 18,000, is traversed by the river Spaarne, over which in the distance can be seen the roof and tower of the Groote Kerk of St. Bavo.

We visited the church. On entering it from the sacristy one of the first objects to attract our attention is the monument to the memory of the engineer Conrad, who died in 1808, and to his colleague Brunings. They were the builders of the great sluice gates at Katwijk. They are styled "protectors of Holland against the furies of the sea and the powers of the tempest." The carving seems to me a little fanciful. I make it to be Neptune seated in a nautilus shell, drawn by sea-horses over the waves, saluting Ceres, seated with her cornucopia on dry land, the whole being overshadowed by something like a large sluice gate.

The suspended models of ships, old Dutch galleons, commemorate the crusade of the year 1218, in which Count

William I. took part. Ships manned principally by men of Haarlem captured the forts of Damietta, throwing open the Nile to the crusaders. The Groote Kerk of Haarlem is a vast Gothic building of the fifteenth century. Large round pillars carry the roof of the nave, which is 70ft. high. It contains the world-famous organ of Haarlem. The building of this organ, by Christian Muller, of Amsterdam, was commenced in 1735, and occupied three years. Until quite recent years it was considered the finest and most powerful organ in the world. It contains 5,000 pipes, the largest of which is 32ft. long and 15in. in



INTERIOR OF GROOTE KERK AT HAARLEM, SHOWING THE FAMOUS ORGAN.

diameter; it has 64 stops, four manuals, and is a pedal one. Beneath its front is an allegorical carving in marble representing Music. This organ was played upon by Handel, also by Mozart when only a boy of ten years old. I heard it on the Sunday, and can bear testimony to the sweetness of its tone, and to the wonderful expression of which it is capable.

The only remaining gate of the old town gates of Haarlem is known as the Amsterdam Thor. Let us for a moment recall one or two of the scenes which this old Gate Tower has witnessed.

The year 1444 was a period of great distress. At that time there were two bitterly opposed factions in Holland, known by the curious names of the "Hooks," and the "Cods."

It was industriously circulated by the Cods that the distress was due to the maladministration by the Hook party, and that increased taxation would be imposed. The Hooks here in Haarlem became angry, and took up arms. The Cods then seized and rang the town bell; at which signal their party also took up arms, and ranged themselves in fighting order. For two days the two factions stood facing each other in battle array, during the whole of which time a priest passed up and down between the ranks carrying the host, and thus prevented the striking of a blow on either side.

A heavy storm of hail at length forced both sides to retire, but the Cods took to rioting, attacking and looting the houses of the Hooks. The tumult was only quelled by the arrival of the Duchess Queen Isabella of Portugal to enforce order.

Then, later, in the great war of independence with Spain in 1572, this Gate Tower witnessed the persevering and obstinate resistance with which the people of Haarlem for seven months withstood the siege of the Spaniards. Wonderful deeds of valour were performed by the starving citizens in bringing supplies into the closely beleaguered city. Three hundred of the women formed themselves into a battalion, and the widow Kenau Hasselaar was the leader of this amazonian corps.

William of Orange attempted to relieve this city, but the Spaniards were too numerous and too powerful for him. They captured one of his officers—they executed the officer, and threw his head, with an insulting message, into the devoted city. The citizens replied by throwing the heads of ten Spanish prisoners into the enemy's camp. The Spanish captain, Don Frederick, wished to raise the siege, but his father, the Duke of Alva, ordered him to persist. At length, after seven months, the Haarlemmers, reduced by the last pangs of hunger, were induced to listened to the fair promises of the Spaniards and surrendered. The treacherous Spaniards set their fair promises at naught, and the Haarlemmers were cruelly massacred.

In process of time Haarlem recovered from this blow, and is now a very flourishing city. Nearly every large town in Holland contributes an equally thrilling page to the history of the War of Independence.

Time will not allow me to say more of our delightful journey, yet there is very much of interest concerning Holland, upon which I have not touched; for example, the special position which her sons have created for themselves in the art world, and there are the giants which she has produced in literature and science; surrounding all there remains the perpetual battle between land and water.

Let me conclude by quoting the familiar lines from Oliver Goldsmith's "Traveller":—

To men of other minds my fancy flies,
Embosomed in the deep where Holland lies,
Methinks her patient sons before me stand,
Where the broad ocean leans against the land;
And sedulous to stop the coming tide,
Lift the tall rampire's artificial pride.
Onward methinks, and diligently slow,
The firm connected bulwark seems to grow;
Spreads its long arm amidst the watery roar,
Scoops out an empire, and usurps the shore.
While the pent ocean, rising o'er the pile,
Sees an amphibious world beneath him smile;
The slow canal, the yellow-blossomed vale,
The willow-tufted bank, the gliding sail,
The crowded mart, the cultivated plain,
A new creation rescued from his reign.

NEW BOOKS.

"PROBLEMS OF NATURE. Researches and Discoveries of GUSTAV JAEGER, M.D., SELECTED FROM HIS PUBLISHED WRITINGS." Edited and translated by HENRY G. SCHLICHTER, D.Sc. 8vo. 262 pages, with glossary and index, and facsimile of a letter to the author from the late Charles Darwin. London: Williams and Norgate. 1897.

A COLLECTION of Zoological and Anthropological papers, re-printed from various sources and covering a period from 1864 to 1885. The influence of gravitation on the organic cosmos and the origin of species are discussed in these papers, and the papers are of interest from a "scientific and from a historic point of view." The paper on "The Configuration of the Arctic Regions," with a diagram extracted from papers published 1865-69, is now of interest, especially comparing the suggestions of the author with the results obtained by Peary, Jackson, Nansen, and others.

"THE MIRROR OF THE SINFUL SOUL." A prose translation from the French of a poem by QUEEN MARGARET OF NAVARRE, made in 1544 by the PRINCESS (afterwards QUEEN) ELIZABETH, then eleven years of age. Reproduced in fac-simile, with portrait, for the Royal Society of Literature of the United Kingdom, and edited, with an introduction and notes, by PERCY W. AMES, F.S.A., Librarian and Secretary to the Royal Society of Literature. London: 1897.

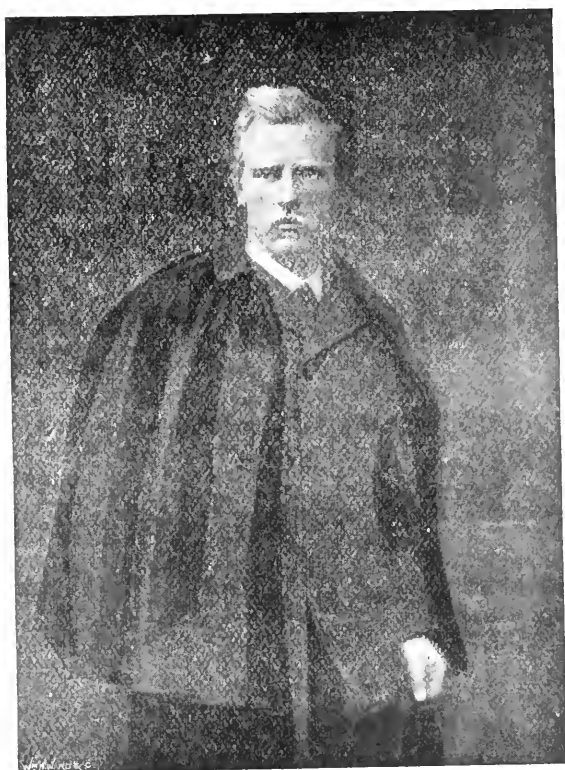
APART from any literary value this book may have, and the Editor admits it is not the best example of the work of Queen Margaret, it is a very remarkable book to be written by a girl so young as the Princess Elizabeth, at the age of 11 years. The preface of 45 pages gives an interesting account of the book, and of the hunt for the authentic portrait, which was eventually found at Windsor and copied by permission of Her Majesty the Queen.

THE FURTHEST NORTH.

BY DR. FRIDTJOF NANSEN.

(See Map of Arctic Circle, prepared by Mr. J. D. Wilde.)

[Notes of the Address given in the Free Trade Hall, Manchester, February
23rd, 1897.]



MR. PRESIDENT, Ladies, and Gentlemen,—It is indeed difficult to describe the feelings with which I stand on this platform to-day, and see the hearty welcome with which you have honoured my wife and myself. I thank you most heartily

for this welcome, and I thank you, Mr. President, for the words you have just spoken of me.

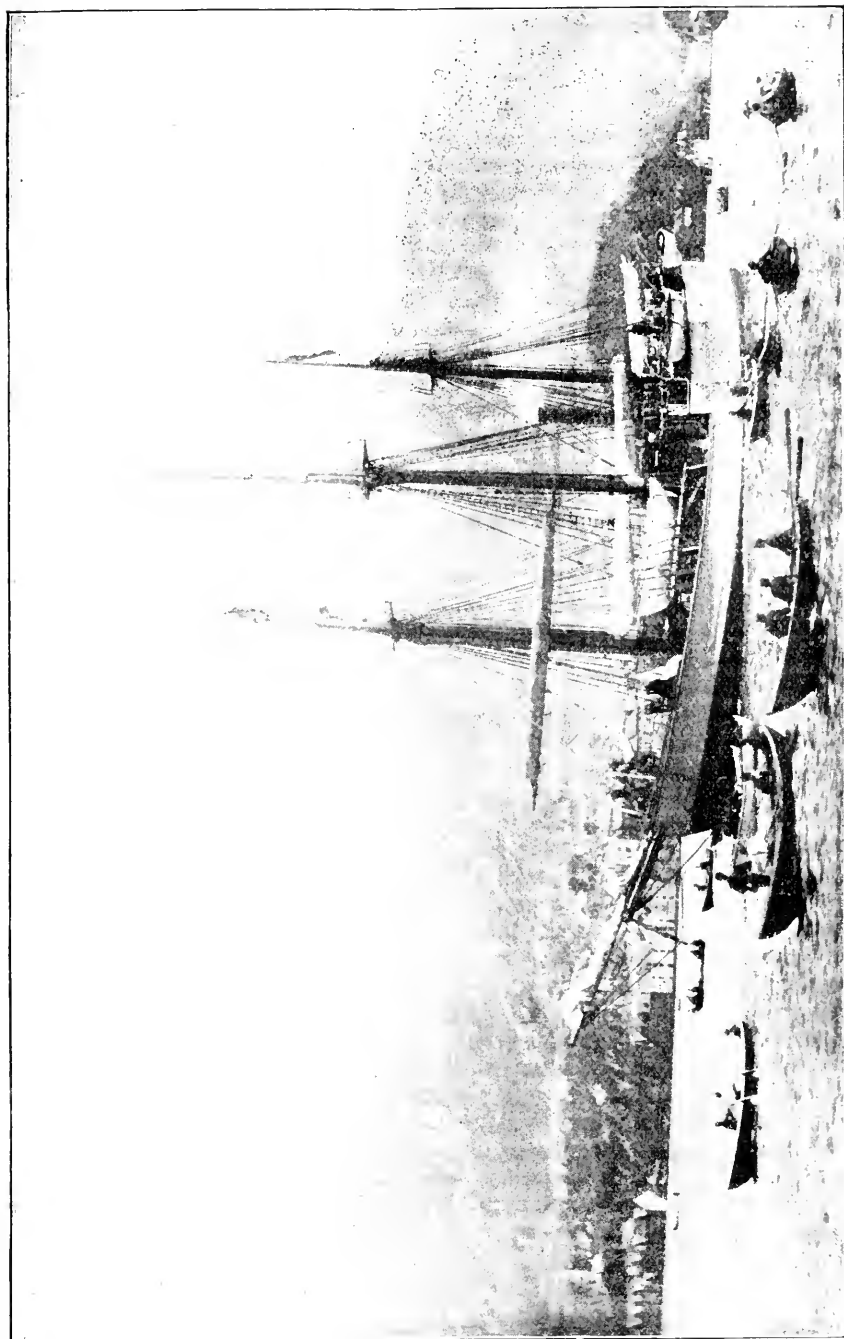
It is just five years ago since I had the great pleasure of speaking to this Society. Then, I had to explain as best I could the plans of the expedition on which I was about to start. I tried to make you understand what objects that expedition had, and I am happy to stand here again to-day and be able to tell you that the plan is pretty much carried out as we thought it would be carried out.

As I told you then, I thought that the ways, the many and various ways, in which men had tried to penetrate the North were not the right ones. In endeavouring to get into the interior of that unknown region, everywhere men had been stopped by the drifting ice carried southwards by the winds and the currents. This ice threatened to crush or to bury them, and the ships had to return.

There was one thing that struck me, and that was that in most places the ice was carried southwards against the ships. If such were the case, I thought that there must be some places where the ice was carried northward, and that such being the case it would be a simple thing to try and work with the forces of Nature, instead of fighting against them. I thought I had reason to believe that there was a current, or a drift we may rather call it, constantly going across the North Polar Region from the sea north of Siberia through the sea north of Franz Josef's Land and Spitzbergen, between those lands and the North Pole, and south again into the sea between Greenland and Spitzbergen. I was convinced that it must be so, and then I thought it was very simple to try to build a ship sufficiently strong to withstand the pressure of the ice, then with this ship sail into the ice north of Siberia, let it be frozen in, and then be carried on that ice across the unknown regions we wished to explore. This is simply what we have done.

As I told you that night five years ago, it was not the object of the expedition—not the main object at all events—to reach the North Pole, or, as I said, “that mathematical point in which the axis of our globe has its northern termination.” The object of the expedition was to explore the unknown regions that surround the Pole, and to bring home from there scientific observations which would enable us to form clearer and more reasonable ideas of those regions than we had before.

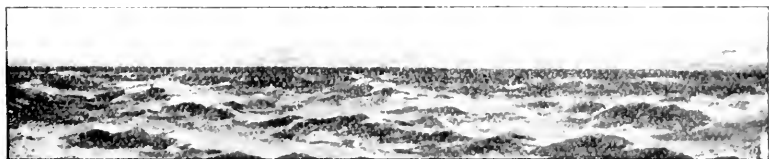
A feature of great importance in the equipment of this expedition would, therefore, naturally be to build the ship as strong and as good for the purpose as possible, and in Colin Archer, the well-known Norwegian naval architect, I was fortunate enough to find the best builder I could possibly get for the purpose. He built for the expedition the strongest and best ice ship that, I dare say, has ever crossed the Polar region.



THE FRAM LEAVING BERGEN (From a Photograph).

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The ship was called the *Fram*, that means "Forward," and on board this ship the thirteen members of the expedition left Christiania on the 24th of June, 1893. We sailed northward along the coast of Norway, and then eastward along the coast of Asia, till we passed the most northerly point of the whole continent, Cape Chelyuskin, on the 9th of September. To the east of this cape we met with the New Siberian Islands, along the west coast of which I hoped to find much open water in which we might sail north. We were fortunate enough to reach such a high latitude as 78 degs. 52 min. N. before we met with ice, and then by sailing along the edge of the ice we understood that it would not be easy to find such open water as would enable us to sail much further north. The only thing now, therefore, was to try to find a good place, to select a good strong floe, and to that to fasten the ship and coolly let it be closed in by the ice and frozen fast. In the picture you see the ice by which we were surrounded.

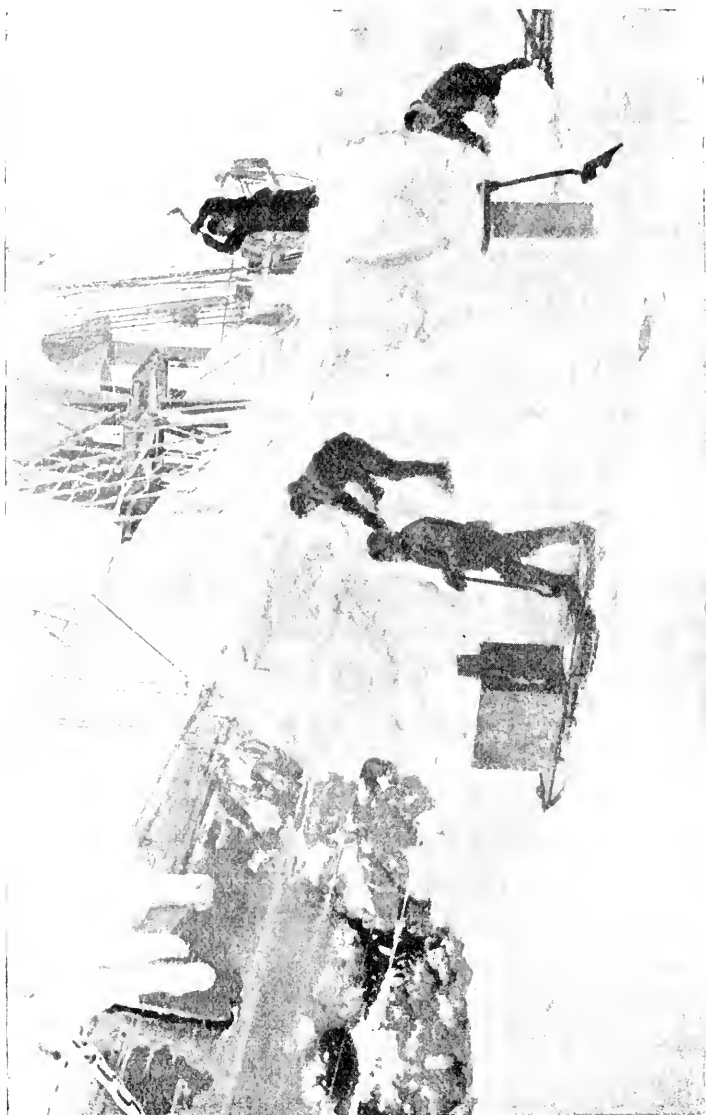


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CAPE CHELYUSKIN, THE NORTHERNMOST POINT OF THE OLD WORLD.

Now the drift of the *Fram* began. We had at first contrary winds and were carried southwards, but after a few months the drift began northwards, and for nearly three years, for 35 months, the ship was drifted across the Polar Regions. You will see on this map, here, a line drawn from a spot to the north-east of the New Siberian Islands across towards the coast of Greenland—that is the same line which, as far as I remember, was drawn across the map I showed when I addressed the Society five years ago. That line, I thought, would indicate the direction in which a ship would be carried, and under this line you will see another line not quite so straight but still pretty much parallel to it, and that marks the actual drift of the *Fram*.

Such a drift is not always very pleasant, especially when it lasts for such a long time. It wants a good deal of patience, but fortunately the members of our expedition had a good supply of that stuff, and thus we managed to get on pretty well. Our ship was, as I have told you, a good one; our cabin was warm, and in it we spent a very pleasant time.



DIGGING OUT THE FRAM, MARCH, 1895.

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The doctor had very little to do, as there was practically no illness on board the ship and he could find no patients, so in his despair he had to take the dogs, as that was the only work he could find to do. A thing of great importance was, of course, to try to find as much exercise for the men as possible. There was plenty of bodily work to do on board the ship, but when the light was sufficient there was also plenty of opportunity to take excursions over the ice, especially on snow-shoes, and on the picture now shown you see a company of "snow-shoers" returning to the ship. On board the ship we had our saloon, or cabin, in which we lived all together, and there we had our meals. We took great care that the food we had was the best possible. I had taken much pains to attend to this department of the expedition, as, in my belief, the reason of scurvy lies always in the food. When there is good food, especially when the meat and fish is well preserved, you may be quite certain you do not run the risk of scurvy, and, as a matter of fact, we had no trace of scurvy on board.

In the evenings, when our day's work was at an end, there was plenty of entertainment of various kinds on board the ship. We often had musical entertainments, when some of the men would play a melodeon or organ or something of that kind. Then we had plenty of books, an excellent library where there were books of all kinds, scientific books, novels, etc. I dare say many members of the expedition read and learned more during those three years on board the *Fram* than they have read and learned during the whole of the rest of their lives. Then we had plenty of games. Almost every evening would see some of us engaged in one game or another, the favourite being a game of cards.

But we had not gone out for pleasure only. One of the principal objects of the expedition was, as I said, to carry home scientific observations, and in these a great many of the members were engaged. Lieutenant Scott-Hansen had to take care of the meteorological and astronomical observations. These want a good deal of time, and every member of the expedition had, of course, to take his turn in helping with the meteorological observations. You will see from the picture shown how it was arranged on the ice; and then the astronomical observations had to be taken in a very low temperature. This was not always very pleasant when the temperature was about 50 degs. below zero, as the instruments and little screws connected with them were very delicate to handle with bare fingers. Often in the middle of the night, when everything was dark, and a lantern had to be used for the readings, our fingers and noses would be frozen, but, of course, there was always the *Fram* to go to in order to thaw them.

Observations of great importance were the soundings. We

had, however, only prepared for a shallow sea in the north. Most people believed that one of the greatest difficulties of the expedition would be land, and that the Polar Sea was so shallow that we might expect land in every direction. Now, however, we were astonished when we came to 79 degs. N. lat. to find that with all our sounding lines we could not reach the bottom. We did not know what to do, and the only thing was to set about making some more line at once, for which purpose we used wire ropes from the rigging of the ship. At last we succeeded in reaching the bottom with 2,000 fathoms of line. In this picture you will see how the sounding was carried on. Every man on board had to help, and we had to draw the line across the ice, passing it over the wheel or pulley through the hole in the ice, but such a sounding would often take us nearly a week, as we had to make many soundings to be quite certain where the bottom was. We had to let out the line 100 fathoms at a time, and then draw it up to see the lead, as we could not feel when it reached the bottom. We went 100 fathoms deeper each time until we got the lead indicating that it had touched the bottom. Then we tried 50 fathoms less, and if we did not get the bottom with that, we knew that the depth would be somewhere between 1,950 and 2,000 fathoms, and that was quite near enough for those regions where much navigation is not expected.

Investigations of much importance were also made in connection with the determination of the temperatures at various depths of the sea, and we had there to read our deep-sea thermometers very carefully. We were astonished to find that this deep-sea basin was filled with comparatively warm water, that is, with water about, and even above, instead of several degrees below freezing point, as on the surface. This water can only come from more southerly seas, and especially from the Atlantic Ocean, by the warm currents that flow into the Polar basin.

These were the most important observations we had to take. In addition, there were, of course, botanical and biological observations, and much besides.

You might expect that the scenery of the Arctic regions would be very monotonous and have very few attractions, and, of course, it is monotonous to a great extent; but still, I dare say, every place has some attraction of some kind, and the Arctic regions are no exception. They have some very great attractions, but the long Polar day, when the sun is above the horizon day and night for about five months, will tire you in time, as there is so little variety. All round is whiteness, which hurts your eyes so much that you have to protect them by coloured spectacles, and when you have looked at this whiteness for some time you do not feel tempted to go out specially to look at it any more.

But when this long Polar day ends and the long Polar night begins, then begins also the beauty. It is necessary to explain how, for instance, the moon will, day and night, be visible above the horizon for weeks in the same way as the sun during the summer will remain above the horizon for months, and during this long midnight there are many wonderful effects. You will all have heard something of these effects which are formed by the moon and by the sun in those regions. You will, however, hardly understand what they are, without having seen them, and words are far too weak to be able to describe them effectually; but even more difficult than to describe the moonlight effects is it to describe the Northern Lights in their ever-changing forms. You will know something about what the Northern Lights are, but it is very difficult to understand their beauty without seeing them. They are ever changing in their forms, like serpents and ribbons of light across the sky. Often five, six, perhaps ten, such ribbons will be seen across the sky at the same time, and then they begin to turn and take all possible shapes. Then, suddenly, rays of light will begin to shoot out from all sides of the horizon, and in a moment all will disappear, leaving only a dark spot in the heavens, the crown or corona. You would never be tired of looking at these strange phenomena. You would think, often, that you are face to face with the forces of Nature, and feel that if you could solve these problems you would be able to solve the deepest mysteries. Then, perhaps, while you are gazing, suddenly it all disappears, and leaves the moon to reign supreme as it did before.

I must admit that often I "long back" to those scenes in the North. I "long back" to that deep silence over which the moon is reigning, where there is nothing at all to disturb you, where you are allowed your own ways, where there are no reporters and no newspapers.

It is said that this long night will have a bad influence on the human mind and body, but I dare say that if I show you a photograph taken after my comrades had spent their first Polar night you will not get the impression that these men have suffered very much. You will see nothing but faces beaming with delight, and most of them fairly stout. In fact, everybody on board grew very much stouter during the voyage—so much so that I thought I should have to starve them a little to put them into good condition again.

During this long night, of course we had many winds. They were not very strong as a rule, but still at times we did have pretty heavy storms, which would drift the snow over the floes, threatening to cover everything. Often the snow was heaped up against the sides of the ship, and at the same time the rigging would be covered by the frost, and then the ship looked more

as if it were built of ice than anything else. Then, exposed to the rays of the summer sun, the snow on the sides of the ship would melt away, all the heaps of snow on the ice-floe disappear, and their place be taken by fresh-water ponds covering the surface of the ice. So that a walk round the ship in July would be rather unpleasant, and you would run the risk of getting wet feet. These fresh-water ponds were often so deep and large that we could use our boats in them, and my comrades often thought it great fun to take the boats from the ship, set up the sails, and have some practice in sailing.

I said that a long Polar day is tiring with all this lifeless whiteness, but still even the Polar day has its charms, especially when autumn approaches and the sun begins to go lower again. Then you might often at midnight have wonderful sky effects, which would remind you of a summer night at home, and we could often then take long walks over the ice. This ice which you see on the picture (the lantern slide) seems to be very rough, but there are smoother places, and when you see the ice from some height it looks fairly smooth and even. From the next picture, which was taken from one of these heights, you will, I dare say, get the impression that it would not be difficult to travel over this ice. But you see, in the distance, ridges of piled-up ice, and when you reach such places you will find that travelling is pretty difficult in spite of all. You will find that not only pulling sledges across, but even simply walking across, would be difficult. But you will soon reach smoother places again where you will get on pretty well, until you quickly again reach rough places where you will have the same difficulty. All this roughness, this piled-up ice, is of course produced by the ice pressures, caused by the changing winds and tide currents. Imagine the ice, for instance, to be drifted to the north, perhaps, by southerly winds, and then suddenly the wind to change and come from the north. The ice from both directions will be forced together, as it were, and then it is easy to see that these great masses of ice meeting each other will produce immense pressures, causing the ice to be piled up until it often reaches 15ft. or 20ft., and higher. You will understand from this how the ice is piled up and such ridges could be formed in a few hours which might last for years. We had some hummocks like this formed in a single night, and drifted along with the ship for two years afterwards.

The ship was often exposed to severe pressure, and the ice was often piled up against her sides and threatened to crush or to bury her. But we had prepared the ship, we had built her for a purpose, and consequently the ice was always forced under her, only to leave her high and safe. You can get an idea of how the ice was heaped up against her sides, in this picture. (See page 51.)

Before we started, most Arctic experts agreed that perhaps a ship as strongly built as the *Fram* would be able to withstand ice pressure during the summer when the ice was soft, and that perhaps the ice would under those circumstances be able to lift her, but they all agreed that if the *Fram*, or any other vessel, should be exposed to severe pressure during the time when the ice was hard, it would be impossible for it to live. Now, however, the *Fram* was not only exposed to ordinary winter pressures, but in January, 1895, she was subjected to the most violent squeezing that any ship has ever been exposed to. She was fast frozen in a floe of more than 30ft. thickness; this floe was over-ridden by another floe, and immense masses of ice came gliding against the port side of the ship. This was in the middle of the winter, when fortunately we had the moon to help us to see something of what was going on and to try to remove some of the ice which was piled up against the sides. The pressure was something tremendous, the ice was piled up high above the bulwarks of the ship, and high up her rigging, and everybody on board thought that she could not possibly live. Everything was made ready to leave her, all the provisions necessary for continuing the drift, living on the ice floe, and also necessary for travelling across the ice homewards to Spitzbergen were carried from the ship on to the adjoining ice. Our sledges necessary for that journey, our "kayaks," our sleeping bags, our clothes, everything in fact, were removed, and no man was allowed to sleep on board except fully dressed, so that he would be prepared to leave the ship at the shortest notice.

But the *Fram* was stronger even than our faith in her. When the pressure rose to its highest I heard, for the first time, her timbers and her beams begin to creak. The noise was tremendous, we could not hear each other speak, and we thought that the ice and the ship might come down over our heads any moment. The pressure was formidable, and now the ship was actually broken out from the ice in which she had been fast frozen, and was slowly lifted out of her icy berth. It was a triumph. Not a single crack was discovered, not a single splinter had been removed.

After that experience none of us doubted that the *Fram* would stand anything, and after that day we slept soundly on board, even during the hardest ice pressure. During the last part of the drift it really sometimes happened that members of the expedition came on deck in the morning to find, by looking over the sides of the ship, that she had been lifted some ten feet above the ice without our knowing it.

One of the first things that we tried to do, after this experience, was to remove the ice which had been heaped up against the port side of the ship. It is easy to understand that this ice was not a very pleasant neighbour, as we might at any

time get the pressure from the other side, and at last the ship be buried. After some weeks we succeeded in removing the ice, and you could again see the black sides of the ship, and we were ready for the time when it should happen that she would be loosened from the ice. The ice now began to crack, and at last only a little of it remained, which was blasted away with powder, and then the ship was allowed to ride on the surface of the water for a little while, but she left her impression in the side of the floe in which she had been frozen. You will see this from the picture now shown on the sheet, and you will understand how very intimate the *Fram* was with the ice.

After having thus seen the trustworthiness of the ship, we decided that it would probably come out sound and safe on the other side, and we understood that so far all was right; but I now thought that something more could be done, and, if so, I thought it ought to be done. I saw that it would be possible to explore some part of the unknown sea outside the route of the *Fram*. I thought that if a sledge expedition left the ship it would be possible to travel across this ice which we had round us, and get further north. You will get an idea of what the ice was like from the picture now shown. It is not quite smooth, there are many rough pieces, but in the distance you will see plains of ice over which travelling is pretty easy. I thought we might expect the same sort of ice to the north, over which we might travel and explore the remoter parts of the sea.

It was evident that if such an expedition were to leave the ship it would not be easy to again find the ship, which was constantly being drifted along. Consequently the expedition would have to be equipped so as to be able to take care of itself and to find its own way back. As it was evident that such an expedition was accompanied with some risk, I had some hesitation in sending another, and, therefore, I had to go myself. As companion I chose Lieutenant Johansen, who gladly agreed to accompany me. I knew him as an excellent comrade, and that he was as strong in endurance as myself. I also knew that I could with safety leave the ship and my comrades, as I left them in the best hands I knew of, Captain Sverdrup. From my experience of him during our journey across Greenland, I knew that Captain Sverdrup would take the *Fram* home if anybody could, and, at all events, I knew that he would take my comrades home as safely as possible.

A point of importance in the equipment of the expedition on which we were now starting was to get some light boats in which we could cross not only the narrow channels we should meet, but also the open sea which we must expect to meet with when we approached land—Franz Josef's Land or Spitzbergen. Therefore we made on board two small boats, in the same fashion as the Esquimaux kayaks. The framework of these boats, being

of bamboo rods, was exceedingly light, and was covered with canvas, so that the whole boat (not more than 12ft. long) weighed about 40lb. These boats would be capable of carrying one man each and several dogs and provisions for about 100 days, as well as the rest of the necessary equipments. We had with us these two boats, three sledges, and twenty-eight dogs, and we had provisions for Johansen and myself for 100 days, and dog food for about thirty days.

We left the Fram on the 14th of March, 1895. The ship was then in a latitude of 84 deg. 4 min. N., and longitude 101 deg. 55 min. E.

The ice we met with on this journey was not so smooth and easy for travelling as we had hoped. On the map now shown you will see the place where we left the ship; you also see the route of the Fram across the centre, going north towards the Pole, turning to the west and then to the south-west. Here is also shown the route of our journey. The ice was often very rough, and travelling was sometimes pretty difficult. You will get some idea of what it was like from the picture now shown. You will understand it is not easy to travel across such ice when the loaded sledges were as heavy as 400 or 500 pounds each, as we had to lift the sledges over every single ice ridge. The dogs could not drag them across, and when we reached this piled up ice they would stop and simply wait for us to carry the sledges over. We had, therefore, often to walk along the ice ridges for long distances in order to find the best place for crossing, and then take one sledge after the other over, and on the other side the dogs would take their part again.

We had much of this rough ice, and travelling was often very difficult, but we had other difficulties, not the least of them being the low temperatures. It was in March when we left the Fram, and consequently with spring approaching we did not expect extremely low temperatures. Therefore, in order to reduce the weight of the equipment of the expedition to a minimum, we had left behind us all that we did not want, and had also left our warm fur coats on the ship. This, however, we soon repented, as during the first few weeks the temperature was for most of the time somewhere about 40 or 50 deg. below zero, and to travel in such a temperature, with light woollen clothing, is not always very pleasant, especially when there is a hard wind blowing, cutting you through to the very skin. But this was not the worst, the worst was when the exhalation from our bodies was condensed in the clothes and formed into ice. Then we had no place to dry our clothes in, as we had only the light tent, and when the temperature was only 40 deg. below zero outside this tent, it was also very nearly 40 deg. below inside. So we could not well dry our clothes there, even if we had taken them off. Consequently this condensation of moisture

in the clothes went on day after day, until after a few weeks we had our jackets quite covered with ice and they looked more like an icy coat of mail than anything else. They were quite stiff, and I dare say if we could have been able to get them off they would have been quite capable of standing up of themselves. Of course, this was very uncomfortable, and the sleeves were often so hard that they would leave wounds in the flesh at the least pressure, so that, I dare say, we have marks of that experience yet.

Now, when we stopped for the night we pitched our tent and spread our frozen sleeping bag as well as we could, and then crept in to try to get that warmth for which we had longed so much during the day. But another process began before we could get our clothes thawed. Some heat was necessary, and the only source of heat we had was our own bodies. Consequently we had to lie there shivering, and with chattering teeth, for an hour perhaps while this melting was going on, and then our clothes, which had been covered with ice, were transformed into wet bandages, in which we had to lie the whole night. The next morning, when we emerged from our sleeping bag, our clothes were again in a short time frozen into ice.

We were very tired when we stopped at night after our hard struggles, and it often happened that in spite of our clothes, in spite of our hunger, we fell asleep as soon as we crept into our sleeping bag. I, of course, had to try to keep my eyes open as well as I could to prepare supper; sometimes I succeeded, but very often I fell asleep and awoke only to find that we had left our precious pot boiling half an hour too long. This was waste of fuel, and fuel was of course valuable, but we had no reason to complain as we had a very economical cooking apparatus. We had brought four gallons of petroleum with us, and that lasted for 120 days, in spite of our cooking a hot meal twice a day for supper and for breakfast, and I dare say if servants at home would use the same economy—(Great laughter.)

After some weeks of this travelling I began to doubt whether it would be wise to continue the journey to the north any further, as I saw we often advanced very slowly. The ice was rough, and we might expect to meet with ice of the same description on our return journey towards Spitzbergen or Franz Josef's Land, and if so it might be doubtful whether we should reach land in time. As, therefore, we did not see any improvement in the ice, I thought it better to stop and examine the ice a little farther north before we went on. We were then in 86 deg. 14 min. N. lat. I went on a little further on my snowshoes in order to examine the ice, but from the highest hummock I could find I saw nothing but rough ice—ridges upon ridges piled up as far as the horizon—and I decided that the right thing would be to turn our way towards Franz Josef Land.

Therefore, the next day, the 8th of April, we began our journey in that direction.

The ice became a little better, and the progress was easier, but still there were many difficulties, the chief being cracks and channels in the ice which we had to pass. These cracks were often covered with a thin coating of ice, which made it impossible to cross them by the help of kayaks. We had, therefore, to walk a long way round in order to find a passage across; you will see how these cracks are formed in the picture now shown, and you also see a picture of the channels. It will give you an idea of what they were like. We often came to places where we met with such cracks and channels, and they were often very difficult to get past. Then, too, we had the ridges, over which we had to carry the sledges. The only way to make the best progress was to go to the top of the highest hummocks we could find in order to get a view of the ice in front, and so pick out a way in which there were the fewest cracks, and channels, and ridges to get over.

I said that when we started from the Fram we took with us dog provisions for thirty days only. Consequently, when those days had gone there was nothing left but to kill the dogs one after the other, in order to feed the rest with those we killed. Of course I must confess it was a very cruel treatment of these poor beasts, which were faithful and true as long as they could go on, but when man has to choose between killing himself and killing dogs, I dare say it is only human to kill dogs. The number of our dogs consequently diminished, and we had soon very few left. The more the number decreased, however, the longer each dog we killed would last, as there were not so many mouths to feed. So with the last few dogs we could travel a long distance.

We had expected to meet with land at about 83 deg. latitude, as, according to the map, there should be land situated in that latitude. But we saw no land, and we travelled the whole of April, May, and a good deal of June, and had come as far south as 82 deg. without any land, without even a black spot in the horizon—nothing but ice covered with snow.

Now we had only two dogs left, and travelling was exceedingly difficult. The ice was covered with deep snow which, exposed to the summer sun, had become very soft and wet. It had, moreover, become coated with a thin crust of ice, through which our snow-shoes and the dogs sank into the snow beneath. Travelling was very hard. We had, however, no choice but to go on as best we could. At last we succeeded in killing a seal, which would give us food for a long time; and on that day, the 22nd of June, we decided to stay where we were for some time, so as to give the snow an opportunity of melting away and leaving us the harder surface of the ice on which to

travel. After three days we also succeeded in killing three bears, and we were thus very well off for food. We had plenty for ourselves, and we could also feed our dogs with as much raw meat as they wanted, and so make them fit for work for a time.

With our two remaining dogs, we, on the 22nd of July, again set out, and after two days' journey (on the 24th) we got the first glimpse of land. We had spoken and dreamed of high lofty peaks with bare rocks, and now we only saw a few small islands totally covered with glaciers—nothing to be seen but ice and snow except at a few places where we could see some black stones projecting out of the snow. But still we thought that this land was just as good as any land flowing with milk and honey. We knew that as soon as we reached it, travelling would be pleasant either in open water or on smooth ice, and we hoped to be able to reach that land the next day, as it looked so very near. But there was still fourteen days of hard struggle to be done before we reached it. The ice was now rapidly drifted in all directions by the currents; it was broken up in small floes, and the surface was very rough. We had a pretty hard time of it travelling across that rough ice, and passing over those innumerable cracks and channels which were often so covered with pieces of ice as to make it impossible for us to use our kayaks in getting across. So we had to choose spots where we could jump from one piece to another, pulling our kayaks after us, always running the risk of seeing them upset into the water. In the picture now shown, you will see Johansen pulling along his boat.

During this time we had an accident which might have had fatal consequences. It was on the 4th of August, and we were just going to pass one of those many channels in the ice. To do this we had to lash the kayaks together while on the ice, put them into the water, get on the deck of the kayaks with the dogs, and then paddle across. On this occasion I had just pulled my kayak up to the edge of the ice, and was waiting for Johansen to draw his up beside mine, when suddenly I heard a noise behind me. Then I heard Johansen say, "Get your gun quickly," and, on turning round, I was astonished to see him on his back with a bear standing over him, and he holding it by the throat in order to keep it away. I reached for my gun, which was on the fore-deck of the kayak, but at the same moment the boat turned over into the water, and I could not get the gun. My first thought was to throw myself in the water, reach the gun from the kayak and shoot from the water, but, of course, I, at the same moment, decided that would be very foolish, as I might easily miss the bear shooting from the water, and then, too, I did not know what the consequences would be for Johansen. I tried to lift the heavy kayak on to the high

edge of the ice again; it was, of course, filled with our whole equipment, and was heavily laden. I succeeded in getting the stern of the kayak on the floe again, and then by stretching myself forward along the edge of the kayak I tried to reach the gun which was lying on the fore-deck. It was not very easy to reach it, and while I was exerting myself to the utmost to do so, I heard Johansen quietly remark, "You had better make haste if you don't want to be too late." The reason of that was that the bear was just going to bite him. It had fortunately paid much attention to the dogs, which were barking at him, and then very often he had turned his head towards me, evidently thinking I must be a funny fellow meddling with that kayak. However, at last I got hold of my gun, pulled it out of the bag, and sitting on the ice I turned round; but in the hurry of the moment I cocked the right barrel, which was only loaded with shot. As I turned I saw the bear had left Johansen and was only four steps distant, so at that short distance I gave him the charge just behind the ear, and he dropped dead between us.

The only result was that Johansen had got a scratch on the back of his right hand, and also when the bear knocked him down, a little of the dirt had been scratched away from his right cheek, so that I could see a light-coloured spot on that cheek for several days after.

We continued our journey, heavily laden with the dead bear's flesh, and after two days more, on the 6th of August, we at last succeeded in reaching the open water, near those first islands we had discovered. We understood, now, that we should probably get much open water to paddle in, and that the ice we should meet with would be pretty easy to travel over, as it would probably be quite smooth. We consequently saw that we should not have much more use for our dogs, and we also decided that it would be exceedingly difficult to carry them with us in those small kayaks, which were quite filled with our equipment and provisions, and on the deck of which we should have a very bad time, always liable to the water washing over. Then, too, we could not carry the dogs if we separated the kayaks at any time. The only thing would be to lash them together, but if this course was not quite impossible, it would have been extremely inconvenient. It would make the progress very slow, and, therefore, you must understand we had no choice but to part with those two most faithful companions. I think I ought to show you the photographs of these, the most faithful companions any Arctic travellers ever had. That is Johansen's dog, and in the next picture you see mine. We could not each kill our own dog, and, therefore, Johansen had to take mine aside and shoot it, while I had to take and shoot his. I dare say that was the hardest work we had to do during the whole of the expedition.

Now we lashed the kayaks together, put them into the water, and we could sail along with a favourable wind with both our sails set. When the wind grew too hard for using both sails we had to use only one and get along as well as we could. When there was no wind we had to take our sails down and row along with the kayaks separate from one another, and still the progress was exceedingly pleasant, and a great change from the rough and hard work in the ice.

The first islands we met with were white with snow and covered with glaciers, but afterwards we came across other islands where there were bare rocks, and I shall never forget the first day when we could place our feet upon bare stones again after more than two years' travelling over ice and snow. I remember well those rocks, with birds sitting on them with their young. The rocks consist of basalt, and those of you who have travelled along the west coast of Scotland will know what they are like.

The end of August was now approaching, and consequently we understood it would be too late to start on the journey to Spitzbergen, and that therefore it would be better to stop on the land we had reached and prepare for the winter. We commenced our preparation for this wintering on the 26th of August, but we had very little to prepare with. Our food was nearly all done, and we thought we had better store away some of it for the continuation of the journey in the spring, and try to find fresh meat on the spot. This was not very difficult, as there were plenty of bears and they were very easy to shoot. We shot some fourteen or fifteen of them, and I think that that number might be considered quite sufficient for two men for one winter. Then there were also plenty of walruses to be found, and these we shot for fuel. They were extremely easy to shoot—you had only to walk straight up to them and shoot them. The blubber of these brutes gave us fuel and oil for the lamps for the winter, and their hides gave us the roofing for our hut. This hut was built of stones, earth, and moss. We dug a hole in the ground, and then built some low walls around it of stone. To roof it we used a piece of drift timber as the ridge piece, stretched walrus hides over it, and then covered it over with ice and snow, and the hut was finished. It was pretty comfortable, it was not very big certainly (10ft. long and 6ft. broad), but still it was all right. It was a little low—I could stand nearly erect in one spot of the hut. Outside it looked more like a heap of stones and ice than anything else, but inside it was tolerably comfortable, and by the help of our lamps we succeeded in keeping the temperature at about freezing point, while near the walls it was, of course, a little lower, and these walls, therefore, through the whole winter had a thick coating of hoarfrost and ice. In the lamplight they

had a beautiful appearance, so that in our happier moments we might almost dream that we "dwelt in marble halls."

The life we led in this hut was rather monotonous, we had very little to do, we had practically no books, our only books being a nautical almanack and a table of logarithms!

Our only food during the winter, except at Christmas and New Year's Eve, was bear flesh and bear fat, and our only entertainment was to sleep. We managed that fairly well, as we slept as a rule twenty hours out of the twenty-four.

It is pretty easy to describe the life we led. I dare say you will already have some idea of what it was, and if I read to you a page of my diary I think you will somewhat better understand what it was like.

"Tuesday, December 24, 1895. And this is Christmas Eve, cold and blowing out of doors, and cold and draughty indoors. How desolate it is here! We have never had such a Christmas Eve before. The bells are now ringing in the Christmas festival at home. I can hear the sound of them swinging out through the air from the church towers. How beautiful it sounds! Now the candles are being lighted on the Christmas trees, and flocks of children are led in and dance around in exultant joy. I must have a Christmas party for children when I get home. This is the time of joy, and there is rejoicing in every house at home. We, too, are keeping the festival in our little way. Johansen has turned his shirt so as to put the inside out. I have done the same, but I have changed my drawers as well, and put on the others which I had wrung out in warm water, and then I have washed myself in a quarter of a tea cup of warm water, using the discarded drawers as sponge and towel. I feel quite like another being. My clothes do not stick to my body as much as they did before. For supper we have had a dish of powdered fish and Indian meal, with train oil for butter in which to fry it, and as sweets we have had bread fried in train oil. To-morrow morning we are going to have chocolate, and bread fried in train oil."

When the spring approached we made ready for starting again, and on the 19th of May last year (1896) we were again ready to continue our journey.

We had no dogs now, and we had to pull the sledges ourselves, but as the ice was smooth the travelling was not difficult. Then, too, we often got favourable winds, so that by hoisting sails on the sledges and then standing on our snow-shoes we could get on pretty well across the ice. The ice, though exposed to pressure between the islands here, was not piled up, and it was mostly quite smooth except for a few small hummocks now and again.

During the journey we met with many walruses. We did not like their flesh for food, but we liked to go up to them to



A WARM CORNER AMONG THE WALRUSES, OFF EAST TAIMYR.
(By Otto Sindling.)

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take their photographs, of which we got some pretty good ones. These walruses did not, however, know how to sit for their photographs. It was exceedingly difficult to make them sit up nicely in the right position, and therefore I had often to prick their noses with my pointed stick in order to make them lift their heads a little.

On the 12th of June we reached open water stretching westwards along the south coast of Franz Josef Land, and we hoped soon to reach the furthest point west on this south coast, and then to be able to cross the sea to Spitzbergen. But the first thing while we were going along this coast we had an accident of rather a serious nature, and I shall therefore read you a description of that accident from my diary.

"In the evening of the 12th of June we put in to the edge of the ice so as to stretch our legs a little, as they were stiff with sitting in the kayak all day. We had been on the ice a little while moving up and down close to the kayaks. The wind had dropped considerably and seemed to be more westerly, making it doubtful whether we could make use of it any longer, and we went up on to a hummock close by to reconnoitre. As we stood there Johansen suddenly cried out, 'I say, the kayaks are drifting.' We ran down as fast as we could. The painter had given way, and the kayaks were already a little distance out, and were rapidly drifting further away. 'Here, take my watch,' I said to Johansen, giving it to him, and as quickly as possible I threw off some clothing so as to be able to swim more easily, but I did not take everything off as I might so easily have got cramp. I sprang into the icy water. The kayaks were already well out, and were drifting rapidly. The water was icy cold; it was hard work swimming with clothes on, and the kayaks drifted further and further, almost further than I could swim. It seemed doubtful if I could manage it. However, everything we had was there, and whether I got cramp and sank, or whether I turned back without the kayaks, it would come to pretty much the same thing, so I exerted myself to the utmost. When I got tired I turned on my back, and then I could see Johansen walking restlessly to and fro on the ice. He could not stand still, and thought it dreadful not to be able to do anything. He had not much hope that I could reach the boats, but it would not be much use for him to also throw himself into the water. He said afterwards that these were the worst moments he ever lived through. But when I turned over again and saw that I was nearer the kayaks my courage rose, and I redoubled my exertions. I felt, however, that my limbs were gradually stiffening and losing power, and I knew that in a short time I should not be able to use them. But there was not far to go now. If I could only last out a little longer we should be saved. The distance became shorter and shorter, and I began to think

that after all I should reach the kayaks. At last I was able to stretch out my hand to the snow-shoe which lay across the stern. I grasped it, pulled myself on to the edge of the kayaks, and thought we were saved. However, I tried to pull myself up, but the whole of my body was so stiff with cold that this was impossible. For a moment I thought that after all it was too late; I was to get so far and not be able to get in. After a little, however, I managed to swing one leg up on to the edge of the sledge which lay on the deck, and in this way I contrived to tumble up. There I was, but so stiff and cold that I could not move. At last, however, I managed to get the kayaks near the ice. Johansen came on board, and I could just creep, with his help, on to the ice. Then I took off my wet clothes, and put myself into the sleeping bag, and after I had lain there a few hours I got warm, and next morning I was all right."

Only a few days later we had another accident which, also, might have had fatal consequences, but, fortunately, that also went well. My kayak was attacked by a walrus which, with its tusks, tore a hole in the bottom of the kayak some six inches in length. The kayak was rapidly being filled with water, and I was sinking, but I succeeded at the last moment in running it into the ice, and managed to get out of it in time and get on the floe. We had again to stop, and it took us a whole day to mend the kayak, to dry my instruments, photographic apparatus, and all my things which had been thoroughly soaked.

But the next day we were ready to start, and as I was just preparing the breakfast in the morning I went up on to a hummock to reconnoitre, and while standing there I heard a sound which I thought had a striking resemblance to the barking of a dog. I could hardly believe my own ears, but at last hearing this sound several times, I was quite convinced that there were dogs, and I rushed to Johansen to tell him. He was asleep, but awoke and gazed at me in a most astonishing way—I dare say he thought I had gone wrong. However, I got my snow-shoes on as quickly as possible, and went along the ice. I had not gone far before I saw a dark object moving towards me on the ice, and I discovered it was a human being. Then came the meeting with Mr. Jackson.

I dare say you have heard so much about that meeting that it is not necessary for me to give details of it. I only say that a more heartily cordial welcome than we got in that high northerly latitude no man ever got in any latitude whatever.

It was perhaps rather strange that we were so well received, as I dare say we were not very much to look at. When I show you the photographs of Johansen and myself, taken just as we returned, you won't get the impression that we were fit for the dinner party they were going to give us. The first thing, therefore, that Jackson asked us was, naturally, whether we should

not like to have a wash, and I dare say neither Johansen nor I had ever enjoyed anything more thoroughly in our lives than we enjoyed that first bath in Jackson's hut. We did not succeed in getting quite clean though—that would be to expect too much. Still, when you see the picture of Johansen after the transformation, you will see there is some difference. (The photographic slide was shown, which caused much laughter.)

We had thought of continuing our journey to Spitzbergen in order to get home as quickly as possible, but I dare say you will understand that the pressing invitation to stay with Jackson and his men, who had behaved so exceedingly nicely to us and given us such a cordial welcome, constituted a temptation much too strong for two men who had been so long away from civilisation. Therefore it did not take long to persuade us to stay and wait for their ship, the *Windward*. We spent six pleasant weeks at Mr. Jackson's hut, at Cape Flora. Their ship then came, and we left Franz Josef Land on the 7th of August; and, thanks to the great skill of Captain Brown, the commander of the ship, we had the shortest and most pleasant voyage home that any Arctic expedition has ever had.

In spite of 240 miles of ice we reached Norway in six days, and on the 13th of August we entered the harbour of Vardo. We had been afraid, Johansen and I, that the *Fram* would return before us, and we had feared that in that case our friends at home would be very much concerned about our safety and would hardly expect to see us again. We were, therefore, rather glad when we heard that the *Fram* had not returned, as we had no doubt she would turn up all right eventually. Therefore I thought I could with certainty telegraph home to the Norwegian Government and the Norwegian King that two members of the expedition had returned, and that we expected the remainder back soon.

At Hammerfest, near Vardo, I was going to meet my wife. When we sailed into the harbour of that town I was very much astonished to see there a smart English yacht with all her colours flying to welcome us, and to recognise on the deck of that yacht my old friend, Sir George Baden-Powell, who had intended to go out in search of us, but fortunately met with us at Hammerfest. Johansen and myself had now the opportunity of enjoying English hospitality on board the yacht, and there we spent some never-to-be-forgotten days. It was also on board her, on the 21st of August, that I was called out of the cabin to receive a telegram. It was handed to me with the remark that there was something in it which would interest me. Now there was nothing in the whole world that would interest me at that moment except to hear something about the *Fram*, and in a hurry I opened the telegram and read—"Arrived to-day. Every man well on board." It was nearly too much to believe.



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Blessing.
Benzon.

Norriahl. Mügetad. Henriksen. Pettersen. Johansen.
Scott-Hansen. Sverdrup. Jacobsen. Naansen.
Amundsen.

Juell.

THE MEMBERS OF THE EXPEDITION AFTER THEIR RETURN TO CHRISTIANIA (From a Photograph)

It was more like a fairy tale than reality, and still it was very real, and the next day I had the pleasure of shaking hands again with the brave men on board the *Fram*.

Now we sailed south along the coast of Norway, and in September we arrived at Christiania harbour.

The drift of the *Fram* after we had left her was pretty much what we had expected, but the *Fram* had even done better than we had hoped of her. She had been, in October, 1895, as far north as 85 deg. 57 min. N. latitude, that is nearly 86 deg. north. From that spot she was drifted in a south-westerly direction, until in July last year she was in a latitude of 83 deg. 14 min. north. Now began, I dare say, the most wonderful piece of ice navigation that has ever been performed. Sverdrup first began blasting the ship out of the ice-floe in which she had been frozen, and after some days of really hard struggle with that, they began to force her a way through the heaviest ice that any ship has ever sailed through. At last they succeeded, by the help of the steam engine, in forcing the ship through these heavy floes, out into the open water 81 deg. latitude, north of Spitzbergen, and then she sailed home.

The expedition was at an end, and its object had been attained. We had crossed the north regions, and we had come home to tell our story. The expedition was finished, and perhaps, therefore, this lecture ought to finish, but before I conclude I should like to say only a few words regarding the results of the expedition.

I have not time to deal fully on that point. The investigations were of such a kind that they have not been worked out sufficiently to be said much about. The material is so big that it would take a year or more to work it all out. I dare say, however, we can say this much, that the Norwegian Polar Expedition has to some extent really solved the North Polar problem. We have now got sufficient information and material to form a pretty clear and reasonable idea of those regions in the North which have hitherto been covered with a darkness into which imagination only could enter. We know that the Pole is not situated in an extent of land, and not in a shallow sea, as was generally believed. We know that the Pole must be surrounded by sea, and that it is surrounded not by a shallow sea but by a sea basin some 2,000 fathoms deep. And this deep sea basin, filled with water of a comparatively high temperature, is covered, not with an immovable mantle of ice, that according to previous belief covered the northern termination of our globe, but is covered with a comparatively thin layer of drift ice some ten or twelve feet in thickness, which ice is in constant motion, constantly being carried from one side of the hemisphere to the other.

But though we have lifted a good deal of the veil that covers

these regions, there are still problems left in the North, and man wants to know everything about the earth on which he is living. Man will never cease to go in search of knowledge, because if he ceases to do that, he will cease to be a man. I dare say one of the deepest desires in the human mind is to know, and even though it may be knowledge which has no actual utility for the moment, we may be quite certain of this, that no knowledge will ultimately be in vain.

I hope that no exertions will be spared to solve the problems still left in the North, but I also hope that many expeditions will be sent to solve those problems which remain unsolved in the South Polar regions, and that man will never cease exploring until he has placed his foot on every spot of the earth he lives upon. With that I will close.

APPENDIX.

The following is a list of the slides that were shown:—

1. Fram leaving Christiania.
2. Cape Chelyuskin.
3. Meeting Floe Ice.
4. Ice Increasing.
5. Map showing Drift of Fram.
6. Doctor of Ship, Dr. Blessing.
7. Crew of Fram returning from Snow-shoeing Excursion.
8. Tea in Saloon.
9. Musical Entertainment in Saloon.
10. Game of Cards.
11. Mr. Scott Hansen.
12. Meteorological Observations, etc.
13. Astronomical Ditto.
14. Deep Sea Soundings.
15. Taking Deep Sea Temperatures.
16. Sunset Effects.
17. Moon and Mock Moons.
18. Northern Lights.
19. Ditto Effects Concentrated in One Spot.
20. Moonlight Scene.
21. Crew of Fram.
22. Fram frozen into Ice.
23. Ditto, showing Fresh Water Ponds on the Floe Ice.
24. Sailing Exercises in Fresh Water.
25. Fram in Ice Pressure.
26. View taken from a Height, showing smooth appearance of the Ice at a distance.
27. Near View showing roughness of Ice.

28. Another View of rough Ice : difficult travelling.
29. Ice Hummocks caused by Ice Pressure.
30. Ditto.
31. Fram surrounded by severe Ice Pressure.
32. Ice Pressure Increasing.
33. Moonlight, showing Fram being severely squeezed.
34. Digging her out of Ice.
35. Clear of Ice again.
36. Open Water, showing where Fram has been frozen in ; lines of the
 Vessel may be seen marked on the Ice.
37. Difficulties in Travelling over the Ice.
38. Johansen.
39. Captain Sverdrup.
40. Kayaks and Sledge for Journey.
41. Getting ready to start for Sledge Journey.
42. Map showing Nansen and Johansen's Sledge Journey.
43. Showing Ice to be Crossed.
44. Ice Hummocks to be Crossed.
45. Hauling Sledge over Ice.
46. Returning from Farthest North.
47. Appearance of Ice, showing roughness.
48. Open Water. •
49. Surveying surrounding Country from Ice Hummock.
50. Johansen and his Last Dog Dragging Sledge over the Ice.
51. Johansen Attacked by a Bear.
52. Johansen's Last Dog.
53. Dr. Nansen's Last Dog.
54. Johansen leading Nansen's Dog away to be Shot.
55. Sailing in Kayaks in Open Water.
56. Sailing in Kayaks with strong wind.
57. Paddling in Kayaks when no wind.
58. First appearance of Land—Franz Josef Land.
59. Basaltic Rocks.
60. Appearance of a Bear.
61. Shooting Walrus.
62. Hut where they wintered.
63. Hut by Moonlight.
64. Preparing to Start again after wintering in Hut.
65. Drawing Kayaks over Ice.
66. Dragging Kayaks over Rough Places.
67. Group of Walrus.
68. Walrus made to sit up for Photographing.
69. Meeting of Dr. Nansen with Jackson.
70. Dr. Nansen as he appeared on arrival at Jackson's Hut.
71. Johansen as he appeared on arrival at Jackson's Hut.
72. Ditto. Transformation after Bath.
73. Elmwood, Jackson Harmsworth Expedition's Encampment.
74. Home Again, Christiania.

THE JACKSON-HARMSWORTH POLAR EXPEDITION.

BY MR. ARTHUR MONTEFIORE BRICE, F.G.S., F.R.G.S.

[Addressed to the Society, in the City Art Gallery, Friday, March 19th, 1897,
at 7-30 p.m.]

MR. BRICE commenced his lecture by exhibiting a slide showing what had been attempted during the past three or four years in the Arctic regions, including the track of Lieutenant Peary along the historic route of Davis Straits, Baffin's Bay, and Smith Sound, and then across the north of Greenland to the extreme north-east of Greenland; and also the route of Mr. Jackson. Mr. Jackson's track was round the North Cape of Norway, into the White Sea, calling at Archangel for Russian ponies, log-houses, and furs, then going north and keeping to the west of Nova Zembla until he reached Franz Josef Land. The archipelago of Franz Josef Land had since its discovery in 1872 always been considered to afford the best possible route to the North Polar region, and upon the advice of such authorities as Admiral Markham, Sir George Nares, Admiral Sir Erasmus Ommanney, and other Arctic men, it was selected for the Jackson-Harmsworth expedition. After tracing these routes upon the map, Mr. Brice said he did not propose to read a paper, but to briefly describe a series of slides showing something of what had been done by Lieutenant Peary, Herr Andrée, and their own expedition.

The first slide represented a characteristic part of the west coast of Greenland, near Disco, where the rocks were so precipitous that the snow would not lie upon them; but behind the rocks, at an elevation of about 2,000ft., the great inland ice cap of Greenland begins, and gradually ascends until it reaches its highest elevation in a wide ridge some 8,000ft. above the level of the sea. It was at Disco that Lieutenant Peary, in 1885, made his first attempt to cross—or, at any rate, to examine—the inland ice of Greenland. He penetrated due east for about 100 miles, was thoroughly satisfied with what he saw, and went back to America hoping to arouse enthusiasm upon the subject; but the Arctic fever was not prevalent at the time; Africa, Arabs, and ivory being the topics of the hour. The next two or three slides illustrated typical forms of ice, and the Kite, in which Lieutenant Peary first went north in 1891, in the act of crossing Melville Bay—one of the most historic

parts of the Polar regions, in which more ships had probably been lost than in any other locality. Another slide showed Inglefield Gulf, in the extreme north-west of Greenland, where Lieutenant Peary placed his first house, called "Redcliff House," from the red coloured ferruginous cliffs behind it; at the summit of those cliffs begins the great inland cap of Greenland, but at the part forming the foreground of the picture there is, during the short Arctic summer, a profusion of flowers and vegetation. "Redcliff House," until Mr. Jackson's experience with Russian log-houses, had been the most successful erection in the Arctic regions. It was constructed of double walls, about 10in. apart, of thin planks covered with tar-paper, the inner wall being also hung with red blankets; there was a rough rampart of rocks and turf about 3ft. from the outer wall, and the whole structure was capped with packing cases and overlaid with sailcloth. Lieutenant Peary's party lived in perfect comfort and health, during two winters of extreme cold, in this slender dwelling, and by placing the stove in a hole so that its top was level with the floor he was able to obtain a comfortable temperature from the ground upwards.

Although man could do a great deal, Mr. Brice thought he would always find himself checked in his progress in the Arctic regions unless he was able to avail himself of the services of dogs, and of all aids to geographical exploration of Polar regions dogs had been chief. Photographs were shown of the dogs obtained by Lieutenant Peary from the Esquimaux on the west coast of Greenland, and by means of which—harnessed with untanned strips of reindeer hide—he crossed the great inland cap. The finest work ever done in Greenland was undoubtedly this of Peary's; certainly, it was Dr. Nansen who first crossed the inland cap, but it must not be forgotten that he crossed it at one of its narrowest points, where it was not much more than 240 miles in width, whereas Peary crossed it a thousand miles further north and at a part where it was about 650 miles wide. Moreover, Nansen adopted the heroic plan of burning his boats—almost literally—behind him, and every step he took brought him nearer to civilisation, to food, and to safety. Peary, on the other hand, leaving comfort and civilisation behind him, set out into the unknown, and under these conditions every mile must have seemed a great deal longer than it actually was. For the first hundred miles he was accompanied by a few Arctic puffin, but from that point until he got across the continent—a march of 600 miles, occupying about 48 days—he never saw a living thing. After this terrible march, in an extremely low temperature, he came to the end of the ice cap, and, descending to nearly the level of the sea, discovered a land practically free from ice, free from snow, and in place of the solemn stillness through which he had been passing, he found birds that sang,



MR. A. HARMSWORTH,

Who provided the funds for the Equipment and Sustenance of the Jackson-Harmsworth Expedition.

bees that hummed, musk oxen going in herds through the low-lying ground, and flowers in full bloom—altogether a most remarkable discovery, and so remarkable that it had never yet been explained. The phenomenon was unquestionably due to some comparatively warm current, but whence that current comes and whither it goes no one knows yet. Lieutenant Peary extended our knowledge of the eastern coast of Greenland by about two degrees north; and quite apart from the great geographical and athletic feat of his wonderful march, Peary's expedition must take first rank by reason of two things—first, the ethnological enquiries which he made into the curious race of Esquimaux beyond Cape York; and second, his very careful study of glaciers in that part of Greenland.

The Esquimaux north of Cape York have a tradition—and the traditions of primitive people contain large germs of truth—that they did not come from the American continent, but from a land far away to the north-east of Greenland. The lecturer thought this tradition was well founded, for when Peary was at the summit of Navy Cliff—3,000ft. high—he looked to the north-east and saw, stretching for some sixty miles, another land where existence was supportable, a high land, but a land entirely free from an ice cap, and where a large Esquimaux population might thrive. It is just possible, therefore, that these men are correct in saying that they came from the north-east. The interior of a native hut is quite warm, for the blubber fires, and the greasy smoke curling round and round, and the almost entire absence of ventilation, bring the heat up to such a pitch that the Esquimaux habitually lives—indoors—in a state of absolute nudity. The ladies wear garments highly ornamented with strips of white reindeer skin, the needles employed being in fish bones, while the thread consisted of sinews chewed in the mouth until sufficiently soft for its purpose.

At this stage of the lecture there were shown photographs of native boats or kayaks, and a group of typical Esquimaux from Cape York, followed by a series of slides to illustrate the formation of glaciers, the latter presenting evidence of stratification, and taking the form of the ground on which they lie, owing to the semi-plastic condition of the ice.

The lecturer then turned to the Jackson-Harmsworth expedition, and showed a picture of the *Windward*, which was originally a whaler of extremely strong build, with no less than 16ft. of oak and greenheart from her bows in before space was reached. Another view represented her starting on her latest journey on the 9th June last, a journey which was finished triumphantly within three months by her return to Europe with Dr. Nansen on board. Her commander, Captain Brown, was one of the first living Arctic navigators, and had for 36 years practically lived in the Polar regions; he had once, to



M^R. F. G. JACKSON

(In Winter dress),

The leader of the Jackson-Harmsworth Expedition.

Mr. Brice's own knowledge, remained in the crow's nest for no less than four days during extremely cold weather, only coming down when his face had reached a condition as indescribable as it was unrecognisable. Several views of the ship were shown, and then one of Elmwood, the settlement formed by the explorers, certainly the most interesting settlement ever erected in the Arctic regions, and probably the most permanent. The street was about 100 yards long, the cliffs above it were basaltic in character, and on their summit—nearly 2,000ft. high—was placed the observatory, to which those gallant explorers ascended winter and summer to take the observations recorded by the instruments placed there. In spite of the opinions of the Esquimaux, exercise and cleanliness were considered to be highly conducive to health in the Arctic regions, and, given plenty of fresh bear, seal meat, plenty of exercise, and comparatively healthy conditions so far as the house was concerned, there was no reason why men should not live for three years, at any rate, in the Arctic regions without injury. The Nansen and Jackson-Harmsworth expeditions constituted records of health, while in eighteen months about 75 per cent of the Nares expedition were down with scurvy—the dread foe of all expeditions—owing probably to the extensive use of preserved meat. From the time the Jackson-Harmsworth party landed at Cape Flora they had bear meat once or twice a day, sixty-three bears being shot in 1894-5, and about thirty in 1895-6. On the ship, too, Captain Brown was able to get bear and walrus, and brought back both his vessel and his crew in the pink of condition. Before Mr. Jackson went to Franz Josef Land he accomplished a wonderful march across the frozen *tundras* of Siberian Russia in mid-winter, for the purpose of testing certain food, clothing, and equipment. The people among whom he travelled were the Samoyedes, perhaps of all men the dirtiest, and of whom a photograph was shown, as also representations of Mr. Jackson's reindeer sledge, which he drove 2,000 miles in a few weeks; Samoyede dogs, the ice in the neighbourhood of Elmwood, a collapsible travelling tent, and an aluminium boat made in sections and weighing about 150lb. Other slides showed the work of sawing and blasting the ice in which the *Windward* had been lying for ten months, and a number of characteristic Arctic scenes and photographs of animal life, also a photo-telesopic view of Cape Gertrude, taken from a distance of about seven miles, and a glacier met with by the party on their westward journey in the whale-boat, *Mary Harmsworth*, in the course of which the known coast of Franz Josef Land was considerably extended, and the fine cape, called by Mr. Jackson "Cape Mary Harmsworth," was discovered.

When bear-stalking Mr. Jackson carried a rifle and a camera, and as soon as he caught sight of a bear he would crouch down

and wave his arms to arouse the bear's curiosity, and very soon the bear would begin to "stalk the stalker." Mr. Jackson waited until the brute got within some fifteen paces of him—taking snap-shots in the meantime—and then dropped the camera and took up the rifle. At three o'clock one wintry morning he was aroused by the barking of his "bearguard," and found there was a bear in the vicinity. Pulling on his boots over his pyjamas, he rushed outside and followed the bear for a mile and a half, and then waited for it to turn round and charge him. In his hurry he had only brought three cartridges with him; the first shot went between the bear's forelegs, the second hit its shoulder. At the third the bear ducked and the bullet went over its head, and the next moment the beast was upon Mr. Jackson, who rammed twenty-three inches of his rifle down its throat. Then it bolted.

A view of the *Mary Harmsworth*, a whale-boat in which the explorers voyaged west, and in which they were nearly lost, was thrown on to the screen. They were in a very severe gale for about four days, with nothing to eat but a few biscuits and a couple of raw birds. The boat was nipped by the ice, carried hither and thither by the surging pack, and blown about fifty miles off the land in the direction of Nova Zembla, but ultimately got safely back. A great many cairns were erected on the summits of the peaks in Franz Josef Land, and upon each was placed a Union Jack.

The history of Arctic exploration, the lecturer remarked, was full of romance and strange adventure, but of all the romance and adventure recorded in the Arctic regions nothing could exceed the meeting of Dr. Nansen and Mr. Jackson in Franz Josef Land. In all that vast expanse of ice and snow and waste, they and their parties were the only human beings, and that they should have met seemed most extraordinary. On the other hand, Mr. Jackson always thought he would encounter, if not Dr. Nansen, some of his party north of Franz Josef Land, and in 1894 he took out a budget of letters for Nansen, and this year when the *Windward* arrived at Franz Josef Land Nansen received news not six weeks old from his wife and friends. Several slides were shown illustrating the meeting of the explorers and Dr. Nansen's appearance at that time. He and his companions had lived in a little hut for ten months, with no fire but a blubber fire, and no light but that which came from it; they had lived in the same clothing for fifteen months, and Nansen's hair—which is naturally very fair—hung on his shoulders in long black streaks. Notwithstanding the hardships he had gone through, he weighed about a stone heavier than when he left the *Fram*. The concluding slides were portraits of Captain Brown and the officers of the *Windward*, and one of Mr. Alfred Harmsworth, who had expended tens of

thousands of pounds on the expedition, and had devoted to it much time and trouble and anxiety and forethought, partly from a permanent interest in Arctic work, but also from patriotic motives. From 1820 to 1860 there was a great and prolonged period of Arctic exploration. Among the nations—and there were several striving—England was easily chief, and ship after ship was sent out from these shores until there had been manned a great Arctic fleet, but with the discovery of the relics of Franklin the interest waned and Africa loomed large. Recently, however, another era of Arctic work had been entered upon; Nansen had done much for Norway, Peary for America, and André was contemplating work for Sweden, but for some time nothing was heard of an expedition from England, which had for so long been in the very forefront. Then Mr. Harmsworth came forward, and in Mr. Jackson found the man to do the work.

NEW BOOKS.

“THE LAKES AND RIVERS OF AUSTRIA, BAVARIA, AND HUNGARY.” (With a sketch of the Ambleve and Ligneuville in Rhenish Prussia.) By Colonel G. B. MALLESON, C.S.I. 156 pages and Map. (*No Index*.) Chapman and Hall, Limited. 1897.

THIS is primarily an Angler's book, but incidentally it is an excellent description of some most beautiful parts of the Continent.

The book covers a wide extent of ground, and is most interesting at this time, as the author describes the river scenery which has just now been so terribly devastated with floods. It is a book the Danubian Voyager will put in his knapsack, and refer to with pleasure and profit.

“NEL PAESE DELLE AMAZONI.” By Professor DOLL. VINCENZO GROSSI. Tip. Dell' Unione Co-operativa Editrice. Roma, 1879.

THIS pamphlet of 130 pages contains a very interesting description of the River Amazon and the vast country from which it draws its water supplies. The author gives a brief account of the various explorers who before him have visited the majestic stream and have studied its productions, and has compressed into his narrow limits a graphic and interesting account of its flora and fauna, as well as a sketch of the Indian tribes who inhabit its banks. His sketch of the myths and of the poetry of the natives will please all lovers of folk-lore. The frequent references to other writers, which render this work especially valuable, will enable the reader to pursue the study of one of the most interesting regions of South America with ease. The map which accompanies the volume is clear, but is rather too diagrammatic to deserve much praise.

WITHIN THE ARCTIC CIRCLE WITH THE ECLIPSE EXPEDITION.

(Illustrated by Lantern Views.)

By MR. THOMAS WEIR (Hon. Secretary of the North-western Branch of the
British Astronomical Association).

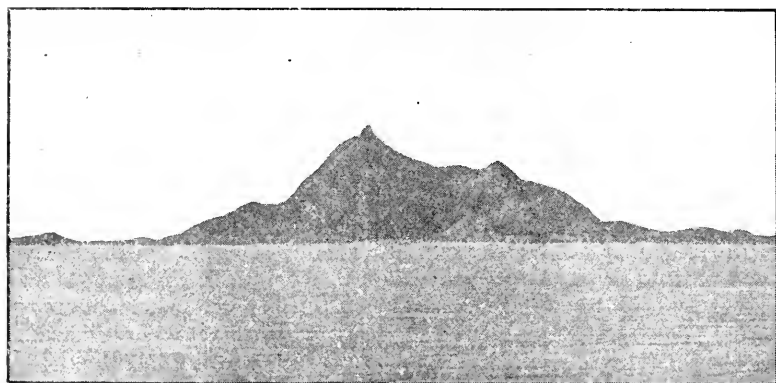
[Addressed to the Members in the Library, February 15th, 1897, at 7-30 p.m.]

THE title of our paper will indicate that we purpose dealing with a small portion only, and in some respects not the most interesting portion, of a specially interesting country. Of the towns in the south of Norway we shall have nothing to say. Even Bergen, the city on the hills, famous for its museums and its fish market; quaint Christiansund, picturesquely seated on three or four islands, whence is conducted a fair share of the dried fish trade of Norway: Trondhjem also, or Drontheim, the ancient capital of the country, with its cathedral, and pastoral surroundings, must likewise be left without further notice as we proceed towards the North.

Our vessel was the *Neptun*, one of the well-appointed mail and passenger steamers owned by the Bergen Steam Ship Company. The captain, officers, and crew were typical Norwegians, proud of their country, careful when on duty, and courteous and helpful towards each other and to the passengers. The local pilots who at each stage came on board and assumed charge as we threaded our way amongst the numerous islands, were men of prolonged experience, as shown by their adroit handling of the vessel and their close acquaintance with every nook and cranny of the coast. It required little effort of the imagination to connect these grizzled veterans with their ancient ancestry, the Vikings of old-world history, who from these very fjords and islands set out to scour the seas and work havoc on their neighbours' coasts. Our table, though spread with modern delicacies, had in addition, always upon it some fare of native sort, such as fish, reindeer venison, and brown or rye bread, etc., reminding us unmistakeably that we were in northern seas, where plain wholesome diet is still eaten with relish. Our fellow-passengers—73 in number—were of eight different nationalities, the English tongue, however, being predominant; and it added to our good fortune to have, as companion in travel, King Leopold of Belgium, accompanied by two of his barons. The presence of royalty, it was at first thought, would place some

be below. And, conversely, if we imagine the sun to be on the right side of the diagram, we have the earth's position in relation to it on 21st June, when the North Pole is turned directly towards the sun, and it will be equally clear (again neglecting refraction) that to our observer at O only the semi-diameter of the sun will, at midnight, be below his horizon, and at all other times above. This position defines the Arctic Circle, and the same reasoning applies to the Antarctic. The diameters of these circles, it may be observed, will therefore subtend respectively an angle of $46^{\circ} 55'$, as viewed from the earth's centre, measuring, as they do, each about 3,240 miles.

As we cross the Circle and in the direction of the open sea, at a distance of two to three miles is the island rock Hestmandso, or Horseman Island, rising to 1,750ft. in height, the summit



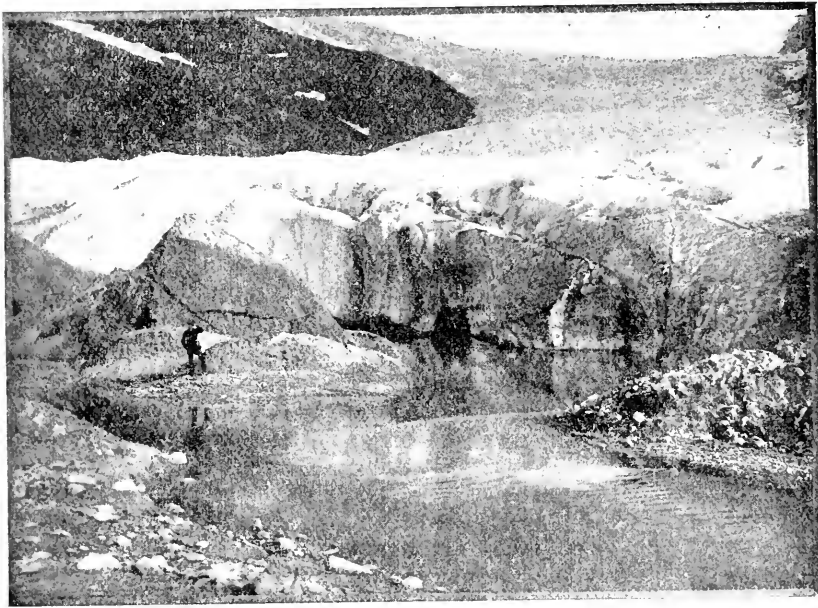
HESTMANDSO, AS SEEN WHEN CROSSING THE ARCTIC CIRCLE.

being considered inaccessible. The name is derived from a fancied resemblance to a mounted horseman in a military cloak. The view landward is not particularly striking from this point, but a little to the north can be descried the entrance to one or two fjords, or salt water lochs. The fjords or firths of Norway are, it is needless to say, a special feature of its coast scenery; and on the western side, where the land is elevated and for the most part mountainous, are both larger and more numerous. In considering how these waterways were formed, it would seem as though in some gigantic upheaval the earth's surface had been rent asunder, producing immense fissures which extend inward in every direction; or they may have been caused by contraction of the earth's crust when cooling from a semi-fluid condition; or again, the effects of the ice during the glacial period may have produced, or have helped to produce, them. The Hardanger, Trondhjem, and Sogne Fjords extend,

with their ramifications, as far as 60, 80, and 100 miles inland respectively; many others varying from 10 to 50 miles in length. The rocks forming their sides rise, in many instances, perpendicularly from beneath the water to a height of 2,000 to 3,000ft.; and a curious circumstance is, that the fjords often exceed considerably in depth that of the sea at their mouth. A remarkable instance of this occurs at the Sogne Fjord, where in the Atlantic opposite to the entrance, bottom is found at 100 fathoms, but at some 90 miles inland the depth of the fjord is quite six times as great. This would point to the probability that the fjords are not cut by the scouring and wearing action such as is seen in the formation of river beds. After crossing the Arctic Circle we pass three comparatively insignificant fjords, the longest of them extending but 15 miles inland; the rocks rise in places almost vertically out of the water to a height of 2,500ft. On the uplands, still higher by 1,000ft., and stretching north and south, is the Svartisen glacier or ice-field, no less than 35 miles long and from 10 to 12 broad, covering the mountains, whose summits only have within recent centuries emerged from their icy shrouds. The extended tongues of the glacier still fill the valleys, and at least one such approaches to the sea level—a striking monument of the great ice age. Desirous of making a closer inspection we landed, accompanied by some of the crew provided with ropes in case of accident. The valley enclosing the river of ice is from two to three miles broad, and its walls are ground by the long-continued movement of the glacier. In its treacherous crevasses, as the sunlight penetrated the mass, were seen the most delicate azure tints, whilst its whole surface, melting under the rays of an August sun, maintained a constant dropping to lower and still lower depths, resulting in a stream of considerable volume, which issued in full flood from the glacier foot. The milky whiteness of this water indicated that the rock-grinding action was still at work beneath, and an object of further interest was the moraine or deposit of stones and pulverised rock, which had been thrust forward by the glacier in its gentle but irresistible course. As I stood to gaze on a spectacle at once so impressive and instructive, the thought occurred that on some day in the yet distant centuries my place of observation might be taken by another traveller, who, pondering the causes of things, might, on viewing the excoriated rocks and rounded and then empty valley basin, be led to the astonishing conclusion that the mighty hollow must surely at one time have been filled with ice! There are other glaciers in Norway greater even than the one described, although Svartisen is the largest lying within the Arctic Circle. On one occasion no fewer than six, high up on the mountains, were within view from one point, distinguishable from the snow, which was always visible, by their tint of greyish blue, each

with its stream of melted ice rolling or leaping headlong to the ocean. The grooving and abrading action, too, of the glaciers of past ages was discernible almost everywhere on this rock-girt coast.

On its western side Norway is protected from the fury of the Atlantic by numberless islands termed, as a whole, the Skjaergaard, or rock-rampart, and whilst they singly and collectively possess high geological claims, the Lofoten group, which our ship is now approaching, surpasses all the rest in interest and variety. These have been not inaptly described as resembling,



SVARTISEN GLACIER.

at a distance, from their notched outline, the vertebrae of some monstrous animal, or still better, the jaw of a great shark, so jagged and close set are the peaks, which occasionally rise in fantastic form above the clouds. Not infrequently did we find ourselves to all appearance entirely land-locked, while at other times we were threading our way by tortuous channels among low-lying islands more or less clad with vegetation in its simplest form. The Raft-sund, or "sound" as we should say in English, is noteworthy for its majestic scenery throughout the entire length, whilst that of Troldfjord, a branch of the Raftsund, and likened by some travellers to an enormous caldron set between the

mountains, is especially enchanting. Its entrance is narrow, and the bordering heights, more especially on the northern side, overhang in an ominous manner; at the head of the fjord the landscape widens; here a valley, beautifully green, stretches to the north, whilst southward, a cataract, from the glaciers above, is seen on the mountain side.

The deck of a steamer is not the most advantageous position from which to study the geological formation of a coast, but as we were often within a few yards of the rocks it could be readily seen that their general composition was of granite in one or other of its forms. In the extreme north, however, the nature of the rocks appears to be metamorphic schist or slate, having veins of quartz running diagonally to the surface.

The Lofoten islands are the seat of the great fishing industry of Norway. Attracted by the warmth of the gulf stream, which reaches even these most northerly shores, amid the quiet and comparative safety afforded by the numerous islands, and finding also suitable shelves of rock at varying depths, the cod fish resort thither to deposit their spawn. The months of January to April constitute the fishing season, when three to four thousand boats, manned by a motley multitude of twenty to thirty thousand men, drawn from the entire coast of western Norway, are employed in taking the spoils of the deep. The annual catch of cod is estimated at thirty millions. The oil, familiarly known to us as "cod liver," is rendered in a crude state in the coast towns, and amounts to a yearly total of some 22,000 barrels, whilst the fish, after being dried, are exported to Spain, Italy, and other South-European countries. The northern waters abound also in porpoises, and a few seals, with their human-shaped heads, were observed on two or three occasions, whilst at another time a full-sized whale was seen disporting itself only a few hundred yards away. Nor did we fail to turn our attention to the more minute inhabitants of the deep. The subject of bacteria in sea water is now receiving considerable attention at the hands of the biologist, and very properly so, seeing that these doubtless constitute the initial food of the higher marine organisms. Somewhat extensive research had already been made by German scientists in the waters of this hemisphere between the latitude of 8° south and 60° north, and advantage was now taken by Dr. Frankland, F.R.S., and his able assistant, Mr. Burgess, to extend these observations as far north as 71° . The water was collected at about two feet below the surface in glass tubes—previously exhausted, sealed, and sterilised—and after preparative treatment, followed by five days' incubation, the "colonies," or developed groups, were counted. Three samples were taken, one from the Vest Fjord, latitude 68° , and five miles from land; the second when off the Lofoten Islands in open waters, latitude $70^{\circ} 12'$, and about

three miles from land; the third when off the North Cape, in latitude $71^{\circ} 10'$, when two miles from land, on which occasion our vessel purposely stood out to sea and was there brought to, in order to obtain suitable dips. The results were somewhat peculiar: in sample No. 1, a mean of two cultivations showed 51 "colonies" per cubic centimetre of water, No. 2 sample was practically the same, but the last, or No. 3 sample, after similar treatment, did not yield a single "colony," from which it would appear that we were passing beyond the region of ocean micro-organic life.

At Harstadt, a town of a few hundred inhabitants, we took



HARSTADT, FROM THE WHARF.

a drive inland for a distance of five or six miles (English) to visit a camp of Laplanders, who had come down from the mountains with the object of placing their herd of reindeer for a short period on the better pasturage of the valley, and at the same time by the sale of trifles to visitors, and by exhibiting their peculiar customs, obtain a little money wherewith to purchase what to them are the refinements of existence. The country we crossed by carriage behind swift native ponies, was not only picturesque but tolerably fertile, forming a veritable oasis in this mountainous desert. At one point the view recalled to mind the vale of Elter-water as observed on approaching it from Grasmere, only without its village and

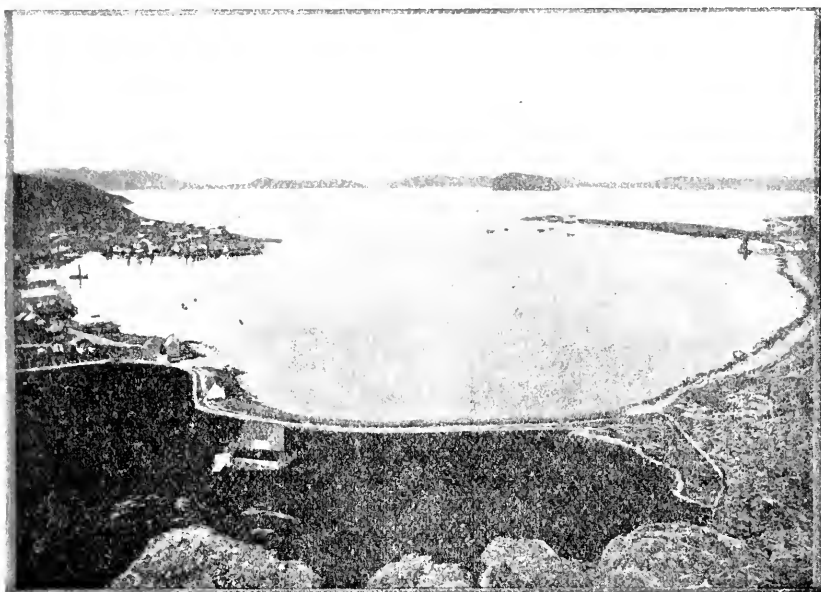
regular roads, but covering a much greater expanse. Several farmsteads were passed on the way, and the haymakers were still busy in the fields. The Lapps we found a rather diminutive people, clad in reindeer skin, with bleared eyes and begrimed faces, probably due in some measure to the smoky atmosphere of their huts. In these they lived gipsy fashion, with a fire of wood in the middle, the smoke escaping by an irregular aperture in the roof, and the same apartment evidently served for the several generations of the family. The babies are carried in a sort of cradle at their mothers' backs, an arrangement which has at least the advantage of leaving both hands free for the performance of general work.

After leaving Harstadt, and making a short stoppage at Tromsø, prettily situated on an island, and whose 6,000 inhabitants are mainly engaged in the fish trade, we passed on to Hammerfest.

Throughout the whole voyage the days had been perceptibly lengthening, until at last there was no darkness during the whole twenty-four hours. The actual disappearance of the sun below the horizon was so brief that the glow lasted till it rose again, and but for the ship's bell, regulating the changes of the watch, we found ourselves at times apt to turn night into day. The midnight sky had an altogether different aspect from that to which we are accustomed, so that at times the stars could be recognised only with difficulty. Polaris had approached much nearer to the zenith, and the whole circle of the heavens seemed to us strangely out of adjustment. In the clear atmosphere of these northern regions, too, we frequently found our general ideas of distance, and of the magnitude of objects and their proportions misleading, and in need of correcting to the altered conditions. We were fortunate, but on one occasion only, in witnessing a mild display of the *Aurora Borealis*, which, as is usual, was in the direction of the magnetic north, the light appearing to proceed from the horizon and to leap upwards in streamers, dying out at an altitude of 30 to 40 degrees.

Hammerfest, with a latitude of $70^{\circ} 40'$, enjoys the distinction of being the most northerly town in the world. It is beautifully situated on the island of Kvalø, and at the head of a bay some two miles in width. Founded in 1787, we find that in 1801 the inhabitants numbered 77: the present population being 2,160. The town consists almost solely of one long street of crescent form skirting the bay, and about its centre in an open space is a fountain with revolving jets, after the manner of Hero's engine, the "Whirling *Elipile*," serving to remind that even in this remote place we were not beyond the range of mechanical genius. Immediately behind the town there rises a lofty hill, whose summit commands a beautiful view seaward. Although stone is plentiful in the neighbourhood, the houses, like those

of all the smaller towns of Norway, are built almost exclusively of wood: these consist generally of either one or two apartments, and the internal equipment is simple in the extreme. The people are more stolid than in the southern towns, and, though far from well-to-do, are clean and thrifty. They possess a modest spirit of independence, and everywhere we were struck with the absence of the vagrant class. Here the height of the men and women is much as with ourselves, but in the southern towns—Bergen, for example—the men may be on an average 1in. and the women about 2in. taller than the people of this country. The different races mingle more closely in the northern towns,

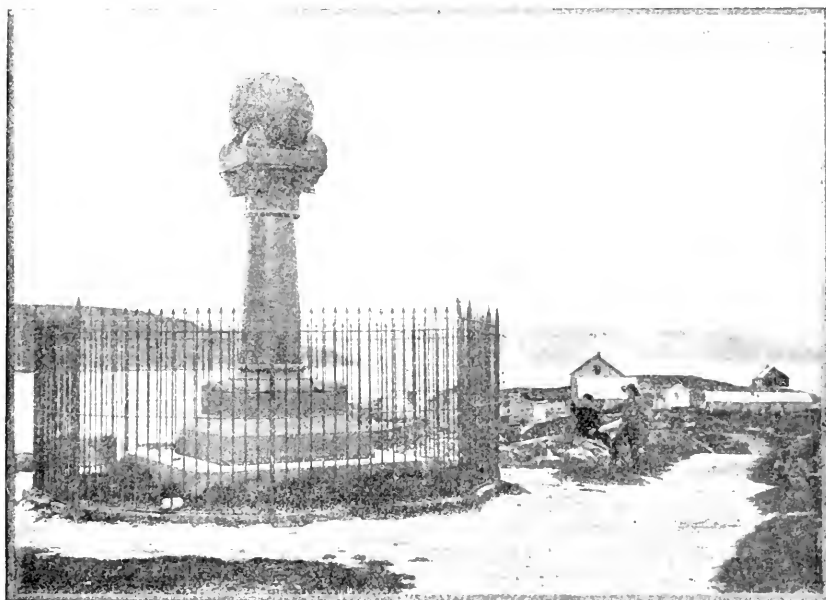


HAMMERFEST BAY. FROM A PHOTO TAKEN AT MIDNIGHT.

(The promontory on the right is Fuglenaes.)

and this was specially observable at Hammerfest. The Norwegian, dressed much as our own seaside villager, is, whether fisherman or shopkeeper, the settled inhabitant. The quaintly attired Finn, quiet in demeanour, is also among the toilers of the deep; whilst the skin-coated Laplander, lured from his pastoral pursuits on the mountains by the greater profits of the fishing industry, lends a Crusoe-like picturesqueness to the scene; and the Russ, encased to the thighs in boots and wearing also the inevitable fur cap, does duty as sailor or as trader. At Hammerfest the sun does not disappear from May 13th till

July 29th, nor is it visible from November 18th to January 23rd. One of the days in each year is thus equal in duration to 77 of our days and nights, and one night is equal to 66 of our nights and days; the remaining 222 days lengthening and shortening proportionably; and if we designate as a day the period when the sun is above the horizon, then a year at Hammerfest consists of 223 days only. In response to enquiry, we were informed that work is carried on throughout the long night of winter just as though the alternating periods of labour and rest lasted 12 hours: the street and wharf are lighted by electricity, as probably the fish warehouses also, and we can hardly conceive a more necessary occasion for its use.



NORTHERN TERMINUS OF THE GREAT RUSSIAN ARC.

The promontory called Fuglenaes, which forms the north-west boundary of Hammerfest Bay, has special interest for scientific geographers as the site of one of the most northerly stations, where, in 1823, Sir Edward Sabine made his famous pendulum experiments to positively ascertain whether or not the earth flattens towards the poles, and it is somewhat remarkable that in the immediate vicinity, if not on the exact spot, is erected a monument to indicate the precise extremity of the great Russian arc, a measurement taken to determine the size and form of the earth with greater exactness. It consists of a

granite column surmounted by a bronze globe, as shown in the accompanying illustration.

A translation of the inscription on the pillar reads as follows: "The northern termination of a meridian line of $25^{\circ} 20'$ from the Arctic Ocean to the River Danube, through Norway, Sweden, and Russia, which, according to the orders of His Majesty King Oscar I. and the Emperors Alexander I. and Nicholas I., and by uninterrupted labours from 1816 to 1852, was measured by the geometers of the three nations—Lat. $70^{\circ} 40' 11'' 23$."

Sir Isaac Newton had stated that the earth, revolving at its present speed, on cooling from a semi-fluid state must necessarily have bulged outwards at the equator and become correspondingly flatter towards the poles, and, from such meagre information as he possessed, computed that the equatorial diameter would exceed the polar by about $34\frac{1}{2}$ miles. This statement became the basis of considerable controversy until it occurred to Sir Edward Sabine (afterwards president of the Royal Society) that the question might be settled by the pendulum test, for it was already known that the nearer a pendulum was to the earth's centre the greater was its rate of vibration, owing to the influence of gravity. Necessarily therefore, he argued, there must be a difference between the rate of a pendulum at the equator and at positions north or south of it. An invariable pendulum was accordingly constructed, and experiments conducted with great accuracy at 13 separate stations. The following were among the results obtained:—

At the Equator the number of oscillations	
in 24 hours was	86,266
,, Greenwich.....	86,400
,, Hammerfest	86,461
,, Spitzbergen	86,483

The general correctness of Newton's theory was thus sufficiently proved.

The principle of the method used for determining the earth's size and form from measurement will be understood by reference to Fig. 7, where deviation from the spherical form is exaggerated for better illustration. The polar axis is again represented by N S, and the equator by E Q. An observer at O, with his instrument in perfect adjustment, notes a star directly in his zenith, and another one degree distant to the north: transporting his instrument until the latter is directly in his zenith he arrives at O¹: the distance between his two points of observation is then carefully measured, and the length of a degree on the earth's surface is the result. This at the equator was found to be $68\frac{4}{5}$ miles, while the same process repeated towards the north,

where the positions of the observer are represented by O^2 and O^3 (the latter corresponding with Hammerfest), gave the value of a degree as $69\frac{2}{3}$ miles. It follows, therefore, that the curvature here is that of a larger circle than at the equator, or, in other words, that the earth flattens towards the poles. Numerous measurements have in this way been made, and the following determinations arrived at by the late Astronomer Royal, Sir G. B. Airy, are regarded as authentic:—

Polar diameter.....	7,899·17 miles.
Equatorial diameter	7,925·64 „
Difference.....	26·47 „

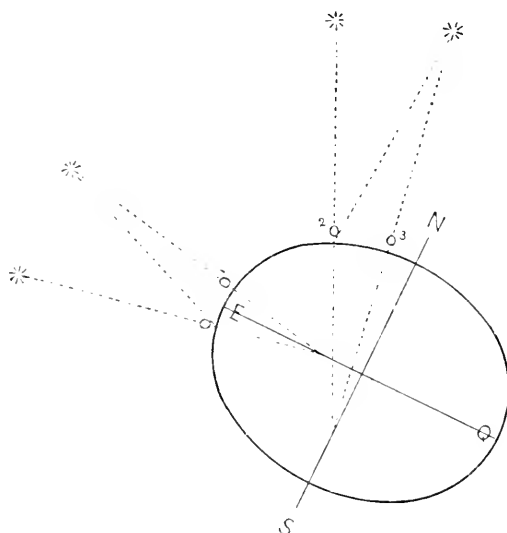


FIG. 7.

From Hammerfest to the North Cape is 70 miles, and on this stage it was computed that half the distance in latitude from Greenwich to the North Pole had been covered. Hereabouts we pass the island of Hjelmso, a favourite haunt of sea-gulls and sea-swallows, which, at the sound of the ship's guns, rose in clouds from their resting places on the rock ledges, fairly darkening the sky in their flight. The absence of small birds in these high latitudes was generally remarked, but flocks of wild duck and geese, heron, oyster catchers, golden plover, and ruffs in full summer plumage were frequently met with.

The North Cape, on the island of Magero, is a noble headland rising abruptly from the water to a height of 1,000ft. The island summit, a comparatively level plateau, is reached from

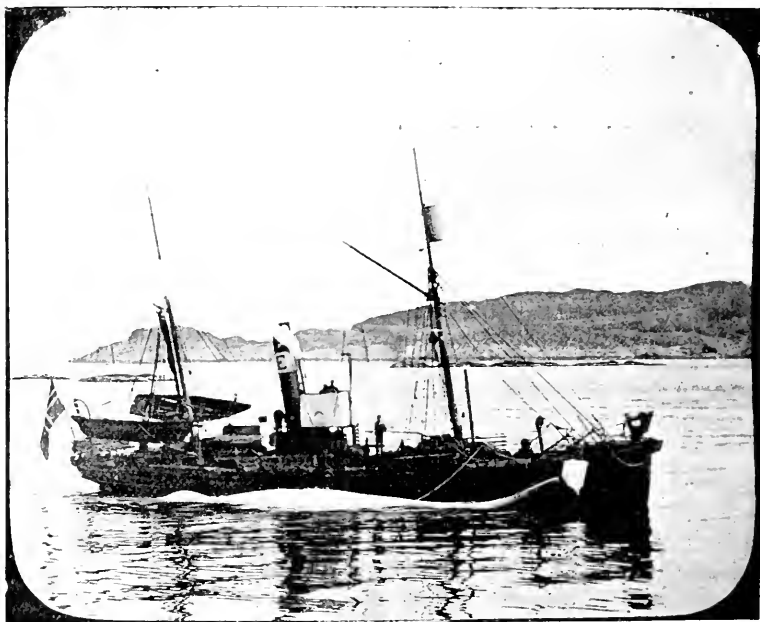
Hornvik bay, lying towards the eastern side. Standing on its most northerly point at the hour of midnight, when the light resembled that of a hazy December day in England, the view in the direction of The Pole was at once striking and impressive. Our surroundings were mostly barren rock, disintegrated in places by the persistent action of the winters' frosts and relieved by occasional patches of stunted grass, contrasting forcibly with the luxuriance of the sheltered and swampy slope by which we had made the ascent. Here in rich profusion there grew plants of numerous species known and unknown, among which we observed the familiar foxglove, pansy, and harebell. Further south also we found an abundance of the small fruit-bearing plants, as the cranberry, cloudberry, and the dwarf juniper.

Pursuing our journey in an easterly direction we arrived at Vardo after a run of 130 miles. The atmosphere of these northern towns is memorable as laden with a pronounced fishy odour, which was the more especially noticeable at Vardo, where it was supplemented by the fumes from a cod-liver rendering place in close proximity to the pier. It may be recollected that it was from this outpost of civilisation on an early July morning in 1893, Nansen sailed for the polar regions, whilst three years later, and, as we afterwards learnt, on the very day of our visit here, the *Windward* with the great explorer and Johansen on board steamed away from Cape Flora, Franz-Josef Land on her return to this port.

Our destination, Vadso, a small fishing town with a low lying island in front, situate on the Varanger Fjord, was reached after a further run of some 40 miles; here we arrived on the afternoon of Friday, August 7th, and taking up our moorings, gave those of our party who had large instruments an opportunity to land them. On the day following we proceeded to Jar Fjord, a branch of the Varanger, about 60 miles still further eastward, to inspect a station where whales are taken after capture. Three of these monsters in different stages of dismemberment were in course of treatment at the time of our visit, and on the return journey, a whaler, with crew's nest, harpoon gun, etc. complete, was met towing a captured whale some 80ft. in length, to the station we had just left.

In order to see a total eclipse of the sun, certain conditions must be satisfied, and whilst neglecting other important factors not strictly bearing on the present case, it will be obvious that the moon's diameter being 2,160 miles, and that of the sun nearly 400 times as great, and their relative distances from us of somewhat like proportion, the shadow of the moon as it passes between us and the sun will be projected on the earth's surface, which it will traverse with considerable velocity. To see the sun totally eclipsed an observer must therefore take up a position on this shadow path, and the nearer to its centre the

better. The moon's shadow in this instance traversed a portion of the Atlantic to the north of Scotland, passing through the north of Norway, Novaya Zemlya, Siberia, Manchuria and Japan, and on to the Pacific Ocean. All things considered, Vadso was the place chosen as the most suitable for observers in this quarter of the globe. Here the moon's shadow would be about 100 miles wide, the town being almost in the centre of its path, and the sun's altitude when eclipsed 15° above the horizon. It was calculated that here the eclipse would commence, by mid-European time (one hour in advance of Greenwich) at 4hrs. 0min. 43secs. and end at 5hrs. 56min. 31secs., on the



WHALER TOWING CAPTURED WHALE TO STATION.

morning of Sunday, August 9th, the period of totality, or entire obscuration of the sun, lasting 107 seconds only.

Never was eclipse prepared for with so much completeness or looked forward to with greater expectation. In the roadstead off Vadso, generally frequented by a few small trading craft, there were now riding at anchor a number of large vessels, including three ships of the British Training Squadron, Norwegian and Swedish men-of-war, and several passenger and private steamers. The Governor of Finnmarken had cordially ceded for the time to the British Astronomical Association the neighbouring island, and there was therefore no difficulty in my

It will be apparent that the depression mid-length of each diagram indicates the period of totality; and we may remark that both the fall of temperature and loss of light would doubtless have been greater but for the interposition of clouds.

The weather for some days previous to the all-important one had been decidedly promising, but it was seen with anxiety that the clouds were gathering on the day immediately preceding. About midnight it rained, and although the sky remained overcast with clouds of varying density, making the outlook doubtful, every observer was at his or her instrument in good time on the early morning of the 9th. The moment of first contact passed, but the sun was still obscured. About twenty minutes before totality it could be seen through a rift in the clouds that the moon had covered the sun for about two-thirds of its diameter, and from this time the scene was most impressive. The position where the sun was known to be was eagerly scanned, and the oncoming darkness observed amid breathless silence. At the calculated moment the moon's shadow could be seen penetrating the clouds and sweeping along with appalling speed, and as it enfolded us the heavens appeared to suddenly fall. The sky overhead and around was of a dark purple tint, whilst behind the distant hills and on the horizon outside the path of totality there was a reddish orange glow, the whole scene being most fitly likened by an observer to a purple pall fringed with gold. The subsequent onrush of light was even more pronounced than that of the darkness, the earth, in the language of another spectator, seeming as one recovering from a swoon. A break in the clouds 29 minutes after totality showed the moon moving away from the sun, and to the observers at Vadsø the solar eclipse of 1896 was over.

GEOGRAPHY AT THE UNIVERSITY.

We are very glad to find by the following syllabus that Geography has now been accepted by the Victoria University as one of the pass subjects. As yet it is only a voluntary one and only permitted to candidates at the preliminary examination.

VICTORIA UNIVERSITY FACULTIES OF ARTS AND SCIENCE.

Preliminary Examination.

English Language. English History. Mathematics.

Three of the following, *one* of which must be a language :—

Greek.	Latin.	French.
German.	Elementary Mechanics.	Chemistry.
	Geography.	

(a) *Physical Geography:*

The agents at work on and beneath the surface of the earth.
Phenomena resulting from earth-heat.
Distribution of land and water.

(b) *Political and Commercial Geography:*

Political and Economic Effects of Natural features and conditions.
Outlines of Geography of the British Empire (including Historical Geography).
Political and Commercial Geography of the United Kingdom.

LIST OF BOOKS ON ARCTIC RESEARCH.

We give a selected list of books (in most cases the actual works of the explorers), arranged in chronological order, showing the progress of Arctic discovery from the earliest period, in the Manchester Free Reference Library and in the Peel Park Reference Library.

Date of Expedition.

- 1498-1517.—SEBASTIAN CABOT. Nicholls (J. F.). *The Life, Adventures, and Discoveries of Sebastian Cabot.* 923-9 C 6.
- 1553-1554.—Sir HUGH WILLOUGHBY and RICHARD CHANCELLOR. *Hakluyt's Collection of Voyages.* Vol. I. f 910-8 H 1.
- *1576-1578.—Sir MARTIN FROBISHER. *Three Voyages in Search of a Passage to Cathaia and India by the North-West.* (Reprinted from Hakluyt, and edited by Collinson.) Hakluyt Society, 38.
- 1585-1587.—JOHN DAVIS. *Voyages and Works.* Edited by Markham. Hakluyt Society, 59.
- Markham (Sir C. R.). *A Life of John Davis, the Navigator; Discoverer of Davis Straits.* 1889. 923-9 D 8.
- 1594-1596.—WILLIAM BARENTZ. Veer (G. de). *The Three Voyages of William Barentz to the Arctic Regions.* Hakluyt Society, 54.
- 1607-1611.—HENRY HUDSON. *Henry Hudson the Navigator. The Original Documents in which his Career is Recorded.* Collected, partly translated, and annotated, with an introduction by S. M. Asher. Hakluyt Society, 27.
- 1612.—Sir THOMAS BUTTON. *Some Particulars of the Voyage of Sir Thomas Button for the Discovery of a North-west Passage to China, Cathay, and Japan.* L 162-8.
- 1612-1622.—WILLIAM BAFFIN. *Voyages.* Edited by Markham. Hakluyt Society, 63.
- 1631-1632.—Captain LUKE FOXE and Captain THOMAS JAMES. *Voyages in Search of a North-west Passage.* Hakluyt Society, 88, 89.
- 1742.—CHRISTOPHER MIDDLETON. *A Vindication of the Conduct of Captain Christopher Middleton in a late Voyage on H.M.S. "Furnace," for Discovering a North-west Passage, etc.* 919-8 M 9.
- 1746-1747.—MOORE and SMITH'S EXPEDITION. Ellis (H.). *A Voyage to Hudson's Bay for Discovering a North-west Passage.* 919-8 M 2.
- Dragge (W.). *An Account of a Voyage for the Discovery of a North-west Passage.* 919-8 M 1.
- 1769-1772.—SAMUEL HEARNE. *A Journey from Prince of Wales's Fort in Hudson's Bay to the Northern Ocean for the Discovery of a North-west Passage.* [Journey by land.] q 919-8 H 1.

- *1773.—C. J. PHIPPS [afterwards Lord MULGRAVE] and Captain LUTWIDGE. *The Journal of a Voyage for making Discoveries towards the North Pole.* H 7'3.
- *1776-1780.—Captain JAMES COOK. *A Voyage to the Pacific Ocean to Determine the Practicability of a Northern Passage to Europe.* 3 vols. q 910'4 C 2.
- 1819-1820.—Sir W. E. PARRY. *Journal of a Voyage for the Discovery of a North-west Passage from the Atlantic to the Pacific, in H.M.S. "Hecla" and "Griper."* q 919'8 P 1.
- Fisher (A.). *Journal of a Voyage of Discovery to the Arctic Regions in H.M.S. "Hecla" and "Griper."* 919'8 F 15.
- *1819-1822.—Sir JOHN FRANKLIN. *Narrative of a Journey to the Shores of the Polar Sea.* q 919'8 F 1.
- 1820-1823.—WRANGELL (Admiral F. von). *Narrative of an Expedition to the Polar Seas.* 919'8 S 6.
- 1821-1823.—Sir W. E. PARRY. *Journal of a Second Voyage for the Discovery of a North-west Passage, in H.M.S. "Fury" and "Hecla."* q 919'8 P 2.
- *Lyon (Captain G. F.). *The Private Journal of Captain G. F. Lyon, of H.M.S. "Hecla" during the recent Voyage of Discovery under Captain Parry.* 919'8 P 4.
- 1824-1825.—Sir W. E. PARRY. *Journal of a Third Voyage for the Discovery of a North-west Passage, in H.M.S. "Hecla" and "Fury."* q 919'8 P 3.
- 1825-1827.—Sir JOHN FRANKLIN. *Narrative of a Second Expedition to the Shores of the Polar Sea.* q 919'8 F 2.
- 1827.—Sir W. E. PARRY. *Narrative of an attempt to reach the North Pole in boats fitted for the purpose, and attached to H.M.S. "Hecla."* q 919'8 P 5.
- *1829-1833.—Sir JOHN ROSS. *Narrative of a Second Voyage in Search of a North-west Passage, including the Reports of Commander J. C. Ross, and the Discovery of the Northern Magnetic Pole.* f 919'8 R 1.
- *1833-1835.—Sir GEORGE BACK. *Narrative of the Arctic Land Expedition along the Shores of the Arctic Ocean.* 919'8 B 1.
- 1836-1837.—Sir GORGE BACK. *Narrative of an Expedition in H.M.S. "Terror," undertaken with a view to Geographical Discovery on the Arctic Shores.* 919'8 B 2.
- 1845-1848.—[Sir JOHN FRANKLIN'S Expedition in the ships "Erebus" and "Terror." The North-west Passage was discovered by Franklin and his companions, but they never returned to England.]
- Fitzjames (Captain James). *Last Journals of Captain Fitzjames of the lost Polar Expedition.* Edited by Coningham. H 90-11.
- McClure (Captain R. C. M.). *The Discovery of the North-west Passage by H.M.S. "Investigator," Captain R. McClure. Edited by Commander S. Osborn.* 919'8 M 14.
- *Snow (W. P.). *Voyage of the "Prince Albert" in search of Sir John Franklin, 1851.* 919'8 F 5.

- Kane (E. K.). Arctic Explorations: The Second Grinnell Expedition in search of Sir John Franklin, 1853-1855. 2 vols. 919-8 K 1.
- *Richardson (Sir John). Arctic Searching Expedition. A Journal of a Boat Voyage through Rupert's Land and the Arctic Sea in search of Sir John Franklin. 1851. 919-8 F 7.
- *Belcher (Sir Edward). The last of the Arctic Voyages; being a Narrative of the Expedition in H.M.S. "Assistance" in search of Sir John Franklin. 1855. 2 vols. 919-8 F 8.
- *Traill (H. D.). The Life of Sir John Franklin. 1896. 923-9 F 1.
- McClintock (Sir F. L.). The Voyage of the "Fox" in the Arctic Seas. A Narrative of the Discovery of the Fate of Sir John Franklin and his Companions. 1859. 919-8 F 9.
- *1869-1870.—K. KOLDEWEY. The German Arctic Expedition and Narrative of the Wreck of the "Hansa" in the ice. 919-8 K 8.
- *1875-1876.—Sir G. S. NARES. The Official Report of the Recent Arctic Expedition. 919-8 N 6.
- Narrative of a Voyage to the Polar Sea in H.M. Ships "Alert" and "Discovery." 2 vols. 919-8 N 7.
- Moss (Dr. E. L.). Shores of the Polar Sea. A Narrative of the Arctic Expedition of 1875-6. (With chromo-lithographs.) 919-8 M 24.
- 1875-1876.—Sir ALLEN W. YOUNG. The Two Voyages of the "Pandora." 919-8 Y 1.
- *1878-1879.—A. E. NORDENSKIÖLD. The Voyage of the "Vega" round Asia and Europe. 919-8 N 13.
(The North-east Passage accomplished.)
- *1879-1882.—GEORGE W. DE LONG. The Voyage of the "Jeannette." The Ship and Ice Journals of George W. De Long. Edited by his wife, Emma De Long. 2 vols. 919-8 D 1.
- 1881-1884.—A. W. GREELY. Three Years of Arctic Service. An Account of the Lady Franklin Bay Expedition. 919-8 G 1.
- 1888-1889.—F. NANSEN. The First Crossing of Greenland. 2 vols. 919-8 N 2.
- 1891-1893.—PEARY EXPEDITION. Keely (R. N.) and Davis (G. G.). In Arctic Seas: the Voyage of the "Kite" with the Peary Expedition. 919-8 K 2.
- *1892-1896.—FRIDTIOF NANSEN. Farthest North. 2 vols. 919-8 N 3.

GENERAL.

- Barrow (Sir John). Voyages of Discovery and Research within the Arctic Regions. 1818-1846. 919-8 B 6.
- Bradford (W.). The Arctic Regions. Illustrated with 136 photographs taken on a Arctic Expedition to Greenland. 1873. Hall Case.
- Brögger and Nansen. Fridtjof Nansen, 1861-1893. Translated by N. Archer. 923-9 N 1.

Facsimile of the Illustrated Arctic News, published on board H.M.S. "Resolute," Captain Horatio T. Austin, in search of the expedition under Sir John Franklin. 1852. f 919·8 O 1.

Leslie (Alex.). The Arctic Voyages of Adolf Erik Nordenskiöld, 1858-1879. 919·8 N 12.

Markham (Sir C. R.) The Threshold of the Unknown Region. [History of Arctic exploration.] 1873. 919·8 M 18.

Nansen (F.) Eskimo Life. 1893. 919·8 N 1.

Nourse (J. E.). American Explorations in the Ice Zones. [Accounts of the different American expeditions.] 919·8 N 18.

Scoresby (W.), An Account of the Arctic Regions. 1820. 2 vols. 919·8 S 10.

Shillinglaw (John J.) A Narrative of Arctic Discovery, from the Earliest Periods to 1851. 919·8 S 1.

NOTE.—The entries with an asterisk (*) are also in the Salford Free Library, Peel Park.

A selected list of books on Arctic Discovery in the Reference Library, Peel Park, Salford, in addition to those marked with an asterisk on Mr. Sutton's List.

1818,—Beechey (Captain F. W.). Voyage of Discovery towards the North Pole, performed in H.M. Ships "Dorothea" and "Trent," under the command of Captain David Buchan, R.N.

1850-1851.—Sutherland (P. C.) Journal of a Voyage in Baffin's Bay and Barrow Straits, performed by H.M.S. "Lady Franklin" and "Sophia," under the command of Mr. William Penny, in search of the missing crews of H.M. Discovery Ships, "Erebus" and "Terror."

1852-1854.—M'Dougall (G. F.). The Eventful Voyage of H.M. Discovery Ship "Resolute" to the Arctic Regions in search of Sir John Franklin and the missing crews of H.M. Discovery Ships "Erebus" and "Terror."

1857.—Armstrong (Alex.). Personal Narrative of the Discovery of the North-west Passage.

1860-1862.—Hall (Captain C. F.). Life with the Esquimaux. 2 vols.

1876.—Lamont (J.). Yachting in the Arctic Seas; or, Notes of Five Voyages of Sport and Discovery in the Neighbourhood of Spitzbergen and Novaya Zemlya.

1876.—Payer (Julius). New Lands within the Arctic Circle. 2 vols.

ARCTIC MAP.

MEM.: Tromsø is situated upon an Island off the Coast, and not on the Mainland as in the Map.

NOTES OF A SHORT VISIT TO THE ISLAND OF SKYE.

By Mr. WILLIAM LANCASTER, Junr.

[Addressed to the Society, Tuesday, April 6th, 1897, at 7-30 p.m.]

A FRIEND of mine who went to Norway twenty-five years ago, when Norway had not then become the new playground of Europe, made it a condition, when he gave a paper on his return home from his trip, that his companion was not to be present, in order that he might be allowed some liberty to yarn a little, or, perhaps, rather to describe things as *he* saw them. But the Island of Skye has been so long visited, and so often described in the wanderings of Prince Charles, the delightful book of Dr. Johnson, "Trip to the Hebrides," and by innumerable writers, that it will be next to impossible for me to say anything new or sensational without being brought to book, even if I assume the Highland cocksureness, of which Dr. Johnson speaks, when he says, "He that travels in the Highlands may easily saturate his soul with intelligence, if he will acquiesce in the *first* account. The Highlander gives to every question one answer, so prompt and peremptory that scepticism is dared into silence and the mind sinks before the bold reporter in unresisting credulity; but if a second question be ventured, it breaks the enchantment; for it is immediately discovered that what was told so confidently was told at hazard, and that such fearlessness of assertion was either the sport of negligence or the refuge of ignorance."

But, from a mountaineering standpoint, Skye was a glorious discovery. Switzerland was exhausted; peaks had been climbed by the right way and the wrong way. Most of the best climbs had been done in Norway. The gullies and faces of the Lake Mountains were finished and become stale; but in Skye, with perhaps the exception of Scurran-Gillean and those mountains which could not be considered climbs, none of the peaks had been climbed. Such an array of pinnacles, ridges, and precipices, where within the small area of a few miles were fifteen or sixteen peaks rising above 3,000 feet clear from the sea, where peak after peak might be climbed without going below 2,500 feet level. The gabbro of which the Black Coolins are formed (distinguished from the granite of the Red Coolins) is splendidly firm and rough, affording capital hold for the hob nails, and it is quite possible to pass over rocks lying at a steep angle with perfect safety.

Undoubtedly the best way to approach Skye is by the long sea route from Oban. One's sailing qualities may be somewhat severely tested after leaving the placid waters of the Sound of Mull, and the full swell of the Atlantic is felt when passing round the grim headland

of Ardnamurchan Point, with its weather-beaten and storm-riven rocks, and the mind is carried back to Johnson and Bos, well drenched and shivering by the alternate spray and rain in an open boat in anything but an amiable mood, longing for his ideal prospects from St. Paul's or Fleet Street. The coast line of the Scottish mainland is very fine—rugged, but of infinite variety; and the steamer suddenly turns and darts unexpectedly into locks and creeks, where picturesque groups of natives come on board, or a horse is swung overboard to swim ashore as best it may. The outlying islets, Egg, Rum, Canna, rear their summits far skyward. Sir Alexander Geikie very well describes this: "Let us fix our eyes on the Coolin Hills, which now come into full view. In all the range of the British Isles there is nothing so alpine in form and so rich in colour as this insular mountain group. Springing from the very level of the sea to heights of more than 3,000 feet, these hills unite in themselves an extraordinary variety of contour. Their splendid crests surpass for ruggedness any other hills in Western Europe until we get as far north as Romsdal and the Lofodden Islands; and as for colour, it is hardly possible to exaggerate the depth of tint the Coolins may assume. Their rocks are for the most part dark in hue, and they weather with a surface which seems in some way to drink in the atmospheric tints. When a canopy of cloud just rests on their summits and casts a shadow over the crags and corries below, their craggy sides put on so deep a hue that we first think of them as black, until, on further reflection, we perceive them to be of the deepest and purest violet. The mountaineer who can spend his holiday in climbing and musing among the crags and corries of the Coolins is a mortal much to be envied."

It is fortunate if the steamer is appointed to call at Loch Seavaig, for here you run into the very heart of the Coolins, and to see Seavaig from the deck of a well-appointed steamer and then stroll up to see Coruish is right for the halt, the lame, and sensible; but there is another way, and that is from Slichagan Hotel, up the Slichagan Glen, over Drumheim. I shall speak of this in its place. The scene is one of wildest desolation: no shrub or tree, nothing but the smooth glacier-polished rocks, and sharp jutting ridges and pinnacles, the steely-grey or dark surface of the loch, according as the light may be, reflecting their savage outlines.

The traces of ice on the rocks appear so recent that you quite expect to see the long sinuous form of a glacier creeping down to the sea. If we did not love the mountains for their own sakes, for the true and pure pleasures they give to all minds open to receive their influences (which may not be weighed or measured as we weigh sugar or measure calico, but none the less real), we might be depressed by this presentation of Nature in her stern and wild character, and coincide with Dr. Johnson, when he says of another part of the Highlands, turning round to Boswell: "It will readily occur to you, sir, that this uniformity of barrenness can afford very little amusement to the traveller, that it is easy to sit at home and conceive rocks and heaths and waterfalls, and that these journeyings are useless labour, which neither impregnate the imagination nor inform the understanding." The long, ribbon-like streams, that seem to creep so silently down the faces of the hills, the masses of scamed débris,

shattered by time and weather, accumulated at their feet. There is no single sound, except the scream, perhaps, of an eagle or the lapping of the wavelet on the pebbly strand. The sail up the Sound of Sleat I will not pause a moment to describe. Passing Broadford the views of the Red Coolins are very fine. Arrived at Portree, a monotonous walk of nine miles brings you to Slichagan Hotel, which is the only base from which an attack of the hills can be made. The great drawback is that Scur-nan-Gillean is the only peak of any interest which can be climbed from here without a very long tramp. In this place, where there is so much weather about, I feel justified in saying a word about it. The rainfall is very excessive, but I am advised that the best time for Skye is about Whitsuntide, when the weather may be fairly reliable; in September and October the colouring upon the hills is much finer than earlier, and sometimes the weather is very good. I slept in an annexe of the hotel with a corrugated-iron roof. During the night a most violent hurrican of wind and rain, with thunder, came on. If the Macdonalds and the Macleods, two clans who had some little differences and often tried to settle them, had been having a battle on the roof I might have been able to sleep, but I was not able as it was. But when the sun shone through my window and I saw the streaming lace-like clouds slowly creeping up the crags of Scur-nan-Gillean, Marscow, and Blaven, and the yellow highland stream in spate, and leaping madly to the sea, I was resigned. It was MacWhirter and Graham's pictures at a glance. We resolved to go to Seavaig and Coruish by way of Glen Slichagan, before named. As I stepped out of the hotel in the morning, a party drove up from Portree, bent upon the same trip, and we joined forces. They looked at my walking boots, which are very strong and heavily nailed, and remarked upon them. There is a pony track, but all the stones which have ever come off the faces of the mountains have stopped on the path. The little rills had become little rivers with the rain. My friends skipped like goats from stone to stone while they were fresh. The fine ridge on the left of Clach Glas, Gorven, and Blaven, clearly outlined against the sky. The place of fusion of the Red and Black Coolins is easily traced, I am told. On the right is Scur-nan-Gillean and the wild recess of Harta Corrie, with its bloody stone, up on to the ridge of Drumheim. The lantern slides will tell you what we saw, and so back. The way to a certain place is said to be paved with good intentions, but I am afraid Glen Slichagan if it had its deserts would be paved with expletives, for a more exasperating, villainous ankle-wrenching thing that calls itself a path I don't know. The goat-like frolics of my companions had ceased after eighteen miles, our replies to each other's questions were very curt and forceful. This is an infallible sign of being tired. The thin boots were cut and torn, the spotless white vest of the morn was limp and perspiration-stained; and so it befell that, some lame, some snaggy, we all got safe to the hotel. One of them said to me, "You are right about the boots."

The summit of Scur-nan-Gillean is best attained by those who are not cragsmen by bearing well down the glen for some distance and then striking the minor ridges or face and bearing round north. As I was alone and the clouds were constantly swooping down and blotting every object, I went very carefully. Alone, I had no subterfuges to resort

to of constantly calling the attention of my friends to the grandeur of the views when you are pumped out and want to take breath. I halted as long and as often as I liked, without being told "You don't go like you once did"; and though solitary mountaineering is not to be recommended, it has its advantages. When the ridges are attained you look into the recess of Harta Corrie; follow this ridge for some distance, and arriving at a few steep rocks the summit is attained. The veil of cloud was torn aside just as I sat down on the summit rocks, which is the converging point of three fairly sharp arêtes, one of which is the pinnacle route to Scur-nan-Gillean, with its famous Rock Gendarme and Knight's Peak forming four rock pinnacles. The second ridge leads to Bhistier, and the third is the one we have first ascended, ending in Scur-na-Urmah. It is impossible to describe views from mountain tops. If I tell you there would be thirty craggy summits within a radius of a few miles, with deep-rifted corries and ravines, an infinite variety of colour in rock and stream and tarn, and the whole archipelago of islands stretching far out into the Atlantic, set in the placid summer sea, it will suffice. And with Wordsworth

"I have felt
A presence that disturbs me with the joy
Of elevated thoughts; a sense sublime
Of something far more deeply interfused,
Whose dwelling is the light of setting suns,
And the round ocean and the living air,
And the blue sky, and in the mind of man:
A motion and a spirit, that impels
All thinking things, all objects of all thought,
And rolls through all things."

It is impossible from personal knowledge to describe any of the sensational climbs, of which there are quite a number, and include the ridges of Clach Glas, Gorven, and Blaven, the before-mentioned pinnacle route of Scur-nan-Gillean, the Bhistier Tooth, the inaccessible pinnacle of Scur Dearg, etc., yet are they not all recorded in the pages of the *Scottish Mountaineering Club Journal*, and of the *Alpine Journal*? The path of Glen Brittle and Corrie-na-Crieich is another delightfully various day, and the ranges are seen from another side. I understand that accommodation can now be had at Brittle House, so that a long walk may be saved.

Some miles from Portree northward is Stoir Rock. The summit of the mountain is cut down in a vertical face 400 or 500 feet in height. Its foot is covered by a mass of débris. These are combined in a variety of intricate groups, while their pinnacled and squared outlines are like a castle and towers. The Old Man of Storr is 160 feet in height and 2,348 feet above sea level. A few miles further north is Quirang, and on the way stood the House of Kingsbury, where Dr. Johnson and Boswell were entertained by Flora MacDonald, and where Prince Charlie found refuge. Quirang, with its verdant platform of even turf, 100 yards by 60 yards, is very remarkable, while standing around, like sentinels, are huge, gigantic columns of rock rising in sharp needles.

Thus in this small island the geologist, the archaeologist, the student of history, and the lover of Nature in her quiet as well as her more

savage moods, may revel, and weary heart and brain may find rest and renewal from the hurry and rush of this work-a-day world.

The late Sheriff Nicholson fitly describes it—

“ Lovest thou mountains great,
Peaks to the clouds that soar,
Corrie and fell where eagles dwell,
And cataracts dash evermore?
Lovest thou green grassy glades,
By the sunshine sweetly kist,
Murmuring waves and echoing caves,
Then go to the isle of mist.”

or with Lowell—

“ The brain
That forages all climes to hew its cells
Will not distill the juices it has sucked
In the sweet substance of pellucid thought
Except for him who has the secret learned
To mix his blood with sunshine and to take
The winds into his pulses.”

NEW BOOK.

“FROM BATUM TO BAGHDAD VIA TIFLIS, TABRIZ, AND PERSIAN KURDISTAN.” By WALTER B. HARRIS, F.R.G.S., etc. 17 full page illustrations, 18 illustrations in the text, and 2 maps and index. 336 pages. Wm. Blackwood and Sons, Edinburgh and London. 1896. Price 12s.

IN fourteen chapters Mr. Harris gives the impressions of a holiday travel through a district abounding in interest at the present time. Starting from Tangier, he gives notes of well-known places on the Mediterranean; but the real interest of his journey does not begin until he has left Tiflis behind. His estimates of the various populations with whom he is brought into contact differ considerably from those of some other writers, particularly of those who have never been in these countries. The description of the famous Armenian Convent at Echmiazin and the tenets of the Armenian Church will be interesting to a large number of people. It is quite plain, however, to those who understand that the very skilful arrangements made for the overlooking of the Armenian Church in Russia, will all tend to its painless extinction. His description of the part of Persia he visited is the description of a country being made ready for absorption by stronger hands than those of the Persian. The Kurds he meets are hospitable, and are superior, in his opinion, to Persians or Turks. The impression left on the mind after reading Mr. Harris's notes of travel are of surprise that it was done so easily and with so little of mishap (he lost all his luggage once); of the hospitality of the people, and of their kindness to a wandering traveller; and of the wonderful organising power of Russia, who is making herself strong in these regions, ready, no doubt, for all events in the future. The volume is not quite so interesting as the “Yemen” of Mr. Harris, but it will well repay perusal, and will raise a good many questions in the mind in reference to the present position and the future of the great district in Asia where “three empires meet.”

NEW BOOK.

"THE FIRST CROSSING OF SPITZBERGEN, ETC." By Sir WILLIAM MARTIN CONWAY, with contributions by J. W. GREGORY, A. TREVOR-BATTYE, and E. J. GARWOOD, with eight coloured plates, reproduced in facsimile from sketches by H. E. CONWAY, two maps, and about one hundred full-page and text illustrations from photographs and sketches. 1897. London: J. M. Dent & Co. Royal 8vo., pp. xii. and 371.

If this book had nothing more to recommend it than the printing and illustrations, these alone would entitle it to a place in every library. But the fact is, Sir Martin Conway is an artist-traveller of no ordinary experience and learning. His descriptive powers make even so grim a country as Spitzbergen attractive, and the reader need have no fear of being bored by this narrative of an expedition to that little-visited and remote northern island. Though the adventures may not be thrilling, except in one instance, where one of the party nearly lost his life in a glacier torrent, the story of their two months' travel holds the reader engrossed from the first page to the last. To begin with, the author gives a brief summary of the history of discovery and exploration in Spitzbergen as a foretaste of an important work on this subject to be published later. Armed with the knowledge he had acquired from a diligent study of records of travel in English, Dutch, Swedish, and other languages, he set about making his preparations with infinite trouble, expense, and forethought. Needless to say, many of the things provided proved wholly or partially unserviceable, such was the unknown nature of the country and the difficulties to be surmounted in exploring it. Yet, after all is said and done, the expedition succeeded where others had failed, in crossing the main island from west to east, in bringing home a sketch survey of an area of about 600 square miles in the heart of the country, in completing a voyage of reconnaissance round the coasts, and in collecting a number of geological and other specimens, besides taking 600 photographs. Beauties of scenery, such as are to be met with in more favoured climes, are not to be expected in this extremely northern land; indeed Iceland, with its volcanoes and hot springs, is a Paradise compared with Spitzbergen. Here, too, the conditions of travel are of the most depressing. A cold, damp climate even in July and August; snow-bogs to be crossed, streams and flooded valleys to be waded; no fresh food, except an occasional reindeer fall a victim to the rifle; no inhabitants, no inns, no communications with the rest of the world. But the artistic sense, the eye ever ready to take in nature's charms though draped in snow and often shrouded by fog and mist, buoyed up our author, and enabled him to make light of difficulties. Added to this, was the delightful sense of exploring absolutely unknown ground—a field wholly his own.

The nomenclature of Spitzbergen owes much to Sir Martin Conway; for, exercising the rights of a first explorer, he bestowed names on peaks, glaciers, and passes suggestive of the Far West; such were Colorado Berg, Baldhead Glacier and Peak, Bastion Islands and Ridge, Bolter Camp and Pass, Booming Glacier, Bunting Bluff, Dead Man's Cape, Hyperite Hat and Waterfall, Ivory Gate and Glacier, Conclave Mountains, Velvet Lawn, etc. He has, however, preserved, as far as possible, those given by earlier explorers, and devotes a separate chapter to the critical examination of these. With regard to the maps—two reductions of his survey and a small inset sketch of the coast line, prepared by the Royal Geographical Society, accompany the volume, but there is a want of a larger general map to enable the reader to follow the expedition from point to point. It is to be hoped that this omission may be supplied in Sir Martin Conway's next work, and that the scientific results achieved by his companions, Dr. Gregory and Dr. Garwood, will also be published.

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MANCHESTER GEOGRAPHICAL SOCIETY.

THE DANUBE AND THE OPENING OF THE IRON GATES.

By Mr. Alderman I. BOWES.

[Read before the Manchester Geographical Society, February 17, 1897.]

ONE of the greatest undertakings of modern civil engineering was completed last year by the removal of many of the obstacles to the navigation of the Danube, and the opening of the so-called Iron Gates. Since the days of the Emperor Trajan numerous projects have been brought forward for accomplishing this desirable end, but it remained for the skill and daring of the engineers of the nineteenth century, to bring to a successful issue this long-cherished desire of the nations bordering on the great river.

The importance of this great work can scarcely be over-estimated, when it is borne in mind that, next to the Volga, the Danube is the largest river in Europe, and for volume of water and commercial importance it far exceeds that river. It is estimated that the Danube carries more water to the sea than all the rivers of France.

A brief description of the course of the river from its source to the Black Sea may not be out of place. For some of these particulars I am indebted to an interesting American book, called "From the Black Forest to the Black Sea." This book gives an account of a holiday excursion by three Americans in canoes over the entire length of the river, and with its illustrations and graphic descriptions gives an excellent picture of the Danube and the different nationalities on its banks.

The river rises at the head of a pleasant little valley high up in the mountains of the Black Forest; coming tumbling down the rocks a tiny stream of clear water, and, gathering strength and volume from numerous springs and rivulets, it cuts a deep channel into the rich soil and dances gaily along, presently to be joined by the Brigach and its twin-sister the Brege, which rise about ten miles further to the south. These are the highest sources of the mighty River Danube, the great

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water highway of Europe, celebrated for ages in legend and song and in ancient and modern history for important military events, and, in its flow of nearly 2,000 miles to the Black Sea, unfolding the most remarkable panoramas of natural beauty known to the geographer; whilst on its banks may be found groups of the most interesting nationalities of the world.

Donaueschingen, a tidy little town in the Grand Duchy of Baden, is sometimes called the source of the Danube. It is situated about a mile and a half below the point where the Brigach and the Brege join the river, which from this point is called the Donau or Danube, and it is the head of the navigation for small boats on the upper river. Between here and Ulm there are 21 weirs and dams, and many pleasant villages, pretty little towns, ruined castles, and princely residences, amongst the latter may be named Hohenzollern, near Sigmaringen, the seat of the Imperial family of Prussia. The scenery in the locality of the castle is of great beauty, and the town, pleasantly situated on the banks of the river, has a charming appearance.

The river below Sigmaringen flows through a broad, fertile valley, and with a quicker current, as the banks have been partially canalised; and small towns, with names of wondrous length and ponderous sound, such as Munderkingen, Kiedlingen, Reichenstein, etc., suggest places that are or have been of great importance. In the distance the great tower of the Cathedral of Ulm is seen rising up out of the low horizon. Ulm is a great military stronghold, and the old town a maze of narrow, crooked streets. The Cathedral is said to be next in size to that at Cologne, and is a fine specimen of Gothic architecture, with the highest stone tower in the world.

Below Ulm several smaller towns are passed before reaching Ratisbon, a city of 40,000 inhabitants, famous for many historical events. The Cathedral of St. Peter is one of the architectural glories of Germany. Freight steamers, barges, tugboats, and passenger steamers abound on this part of the river. Long flat boats, 60ft. long, such as we see on the Rhine, pass down to the Lower Danube, laden with grain, timber, etc.

Linz, with its 50,000 inhabitants, is an interesting town; and the river scenery, between here and Vienna, is said to rival the Rhine scenery, the hills being more varied in outline and the slopes richer in verdure.

At Vienna the river is more crowded still, and is crossed by some fine road and railway bridges; and many show sights are here, such as cathedrals, historical buildings, etc., and more than a fair share of cafés, theatres, and music halls. In this respect it rivals Paris, and, some say, exceeds it in wickedness.

After leaving Vienna, Hainburg, Kieben, and Presburg (with its 50,000 inhabitants), where the Hungarian kings have for

ages been crowned, are passed; then Komorn, and through the fertile plains of Hungary to Buda Pesth, a beautiful, prosperous city, with a population of 500,000. We have had so many descriptions of it lately in connection with the great Hungarian Exhibition held here in 1896, that I need not take up your time in speaking about its abounding beauties and attractions. It is said that the extensive quays facing the river and the imposing buildings are the finest on the whole course of the Danube. Lower down the river the inhabitants on either bank show distinct traces of Magyar descent.

And now, leaving the Hungarian territory for Servia, Belgrade with its great fortress comes in sight. Many parts of the city are Turkish in appearance, and the inhabitants are a mixture of Hungarians, Turks, and Servians.

About 60 miles below Belgrade the river leaves the Hungarian plains, and at Bazias the chief hindrances to the navigation of the Danube begin and extend to Sibb, a distance of about 82 miles. The obstructions may be divided into four sections, viz.: No. 1, The Stenka Rapids; No. 2, The Kozla Dojke; No. 3, The Greben Section; and No. 4, The Iron Gates. The first-named rapids are about 1,100 yards long; nine miles lower down the second section—about $1\frac{1}{2}$ mile long—begins, and the river is narrowed from about 1,000 yards in width to about 300, and in some places 170 yards. These rapids are caused by rocks in the bed of the river, some of which are almost dry at low water, extending nearly across it, and causing sudden alterations in the currents and dangerous whirlpools and eddies.

At Greben, four miles lower down, there were formidable obstacles to be overcome, and some of the heaviest work in the undertaking had to be faced; for at this point a spur of the Greben Mountain juts out into the river, and suddenly reduces its width from 800 to 400 yards at high water, and about half this width at low water. When the snow and ice in the upper reaches of the river melt, or in heavy rain, the river rapidly rises, and, being blocked by these obstacles, causes damaging floods in the fertile valleys of Hungary.

The point of the Greben Mountain had to be entirely removed for about 160 yards from its original face, and to a depth of 6ft. 6in. below low water level (this depth was afterwards increased to 13ft.). The method adopted for removing this immense mass of hard rock was chiefly by chamber mining and blasting by dynamite, in charges of four to five tons, fired by electricity. The largest blast made was in 1894, when about 240,000 cubic yards were thrown down by an explosion of 12 tons of second grade dynamite. The stone brought down was utilised in building the training walls in many parts of the improvements carried out.

Below the Greben rapids the river widens out to about $1\frac{1}{2}$ mile, and passing the cutting and training walls at the rapids of Jucz enters the Kazan defile, which is said to be the most picturesque part of the Lower Danube. The cliffs, of great height, approach nearer and nearer to each other, until the river is contracted to 120 yards wide.

Passing through this dark and sombre defile into the valley of Dubova, it widens to 500 metres; the mountains again approach and reduce the width to about 200 yards. The depth at these straits varies from 10 metres to 50 metres. It was through this defile that Trajan, nearly 2,000 years ago, made riverside roads and towing paths in continuation of the small canals and waterways made to evade the rocks and currents, and to facilitate the transport of his armies and military trains for the Roman campaigns in Central Europe. The ruins of these works are a proof of the great labour expended upon them, and also of the skill in engineering possessed by the Romans in those days. The tablets engraved on the rocks, still in part visible, commemorate their heroic deeds.

Following our course down the river, at 10 kilometres from the Kazan, we come to Orsova, a rather important place of call for steamers and trading vessels; and, now that the river is navigable for larger vessels, this place is destined, from its railway communications, etc., to become a great trading centre.

At a distance of eight kilometres from Orsova, the Iron Gate, situated between Roumania and Servia, begins, and is for a length of about three kilometres the largest and most dangerous obstacle on the Lower Danube. The rocks in the channel impede the current, forming dangerous eddies and cataracts.

The Prigrada Rock rises above low water with a width of 250 metres and length of about two kilometres, stretches in a crooked line across the river to the Roumanian shore, with a narrow channel, through which vessels of light draught only can be navigated with difficulty. The river, pouring over this rock, forms dangerous whirlpools and cataracts, requiring the greatest watchfulness, care, and experience on the part of the navigator to overcome the dangers of what has well been called "The Iron Gates." Hundreds of steamers and vessels have been wrecked in attempting this dangerous passage.

How serious were the impediments to navigation in this section of the river may be judged from the fact that, for only one-half the time it was not blocked by ice, could vessels pass along the waterway on account of the low water level.

Time will not permit me to give a detailed description of the canals, training walls, excavations, and other works connected with this important undertaking, but a brief description of the mechanical appliances used on the work may not be out of place.

The original design was to excavate the channels and form the canals with a depth of 6ft. 6in. below low water mark, but during construction it was decided to increase this depth to 13ft., so that ultimately steamers drawing four metres coming from the Black Sea, *via* Braila or Galatz, may go up without hindrance to Orsova; or, if drawing three metres only, up to Buda Pesth and Vienna. But before this can be accomplished other improvements in the upper bed of the river will have to be made, and it will probably be 1899 before the great project is completed. The width of the canal and channels varies from 70 to 90 yards at the bottom. The greatest difficulty was the removal of the submerged rocks. This was accomplished chiefly by rock-drilling machinery and blasting with dynamite. The drills were of the Ingersoll type, worked by steam power from barges; four drills, 4½ in. diameter, were worked from each barge. The holes when drilled were washed out by a jet of water, the dynamite lowered into the hole through a protecting tube, and fired by electricity. The loose rock was then removed by dredgers; one, specially designed for removing the larger pieces, was built by Messrs. Lobnitz and Co., of Renfrew, and is a remarkable vessel of this class, fitted with powerful engines, strong steel buckets, and elastic pitch chain drive.

Another method adopted was by a rock-cutter falling freely from a height on to the face of the rock and shattering it to pieces. In this machine the cutters are of different lengths, from 20ft. to 30ft., and are formed of iron bars weighing about eight tons each. The lower end is forged to a chisel shape, and a core of steel welded in the centre, which, when hardened, keeps the point sharp. The cutter works through a well in the centre of the barge, and is raised by winches driven by steam power, similar to pile-driving machines. The drop given to the cutter is about 5ft., and from 50 to 100 blows can be given in the hour. As the rock is cut in one place the barge is moved sideways, and another cutting commenced. Other types of rock drills, barges, etc., have been used, but those I have described have done the principal portion of the work.

The cutting through the Prigrada rock at the "Iron Gate" was comparatively easy work. The river was diverted, leaving the bed of the canal dry; the boring and blasting being performed by hand, and the broken rock taken away on trucks drawn by locomotives, and deposited on the training walls. The dams and training walls are of the ordinary construction, and are all built of stone, with flat revetments to protect them against the ice. The canals are made bell-mouthed at each end.

Like many other great projects, many schemes had been proposed, and plans for carrying them out by different authorities had been considered, but nothing definite was done until,

in 1888, the Hungarian Government, under rights conferred upon it by the Berlin Treaty of 1878 and the London Treaty of 1871, undertook the work of construction and administration, under the conditions of the treaties, which gave them the power to levy tolls on trade ships for covering the expenses of the works.

The preparation of plans and method of working were entrusted to Messrs. Vasarhelyi and Wallandt, both of whom are Hungarians, and who are alone responsible for the engineering details. Work was commenced in September, 1890, and it was estimated it would be completed in five years, and that the cost would be £900,000. (This amount was increased by the cost of the extra depth the excavations were carried to.) A contract for this amount was made with Julius Hajdu, a Hungarian engineer, Hugo Luther, manufacturer, and the Berlin Discount Company.

To commemorate the date of the commencement of the work, the contractors cut a memorial tablet in the rock wall on the Hungarian shore, with this inscription: "These works, sanctioned by the XXVI. Law of 1888, and destined to remove the navigation hindrances at the Iron Gates and other cataracts, were begun in the reign of the Hungarian King, Francis Joseph I., in the time of the Prime Minister, Count Julius Szapáry, by the Minister of Commerce, Gabriel Baross de Bellus, on the 15th September, 1890. God bless this work and its creators."

Some work still remains to be done to the approaches, etc., to render the river navigable at low water. This will not be completed until 1899, when it is estimated the total expenditure will amount to £1,860,000.

The ceremony of the inauguration took place on the 27th September, 1896, when the Emperor of Austria, King Charles of Roumania, and King Alexander of Servia, with an immense gathering of bishops, generals, and diplomatic representatives, etc., met at Orsova, and proceeded through the Iron Gates and the beautiful and romantic Kazan Pass with a procession of six vessels, which included a monitor and torpedo boat, and accompanied by a continuous discharge of artillery and the loud huzzas of the immense gathering of soldiers, visitors, and inhabitants.

The steamer Francis Joseph, which conveyed the three Sovereigns and their *entourage*, led the way, being everywhere greeted with marked enthusiasm by the population, not excepting the Turkish inhabitants of the island of Adakaleh. Its passage through the channel was accompanied by an almost continuous discharge of artillery, which was kept up on the Servian and Roumanian shores as the ships steamed past. On entering the canal the Emperor-King proposed a toast, which was drunk by the three Monarchs from golden goblets specially

prepared for and commemorative of the occasion. His Majesty, speaking in French, said—

“At this moment, in which we are united in celebrating a great work of public utility, I am happy to welcome the Sovereigns of two friendly States, the neighbourhood of whose shores, watered by the Danube, symbolises the community of our interests. The works, which were entrusted to Austria-Hungary by the European Areopagus assembled in Berlin, are finished. The last hindrances that opposed the free passage of this great stream are removed. Proud of that great mission, I declare the new route open to commerce, convinced that it will give a powerful and salutary impulse to the development, as peaceful as it is lucrative, of international relations. I drink to the health and the prosperity of our peoples.”

Below the Iron Gates the river broadens out, and the scenery is tame and uninteresting, for the vast plains of Roumania extend from the foot of the hills here to the shores of the Black Sea, and the maritime and commercial aspects of the surroundings begin to manifest themselves—the river becomes more crowded with craft of all kinds as we approach the towns on the Lower Danube.

We pass Widin, and, lower down, Sistova, where, in the Russo-Turkish war, the Russians crossed the river to Plevna and the Balkan passes. Thirty-five miles lower down we reach Rustchuk, the most important Bulgarian town on the river, and fast becoming a great emporium of trade, being on the main line of railway to Constantinople, *viâ* Varna.

We then pass Silistria, and approach the longest railroad bridge in the world. The bridges over the Tay and the Forth have lost their pride of place as regards length, for the new bridge over the Danube at Czernavoda has just been completed. The length of this structure, exclusive of its approaches, is 13,325ft. The principal spans crossing the river itself are respectively 620ft. and 455ft. The remaining spans run over some nine miles of ground, which is for a lengthened period of the year subject to inundation. The height of the bridge at the centre of the main channel of the river is sufficient to allow the largest vessels frequenting the Danube to pass under even at high water. It will be remembered that the length of the “Tay brig” is 10,725ft., and that of the Forth 7,800ft. America has the Mississippi Bridge, which is 10,600ft. This bridge crosses the Danube below Silistria, and carries the railway from Kustendji on the Black Sea into Roumania.

Braila, 125 miles from the mouth of the river, is the chief port for the shipment of produce, etc., from the grain-growing regions of Roumania and Northern Bulgaria. Here are extensive docks, grain elevators, and thousands of men of all nationalities engaged in loading steamers and sailing vessels from all

countries. The British flag is everywhere present. As a commercial port the place is fast outstripping its neighbour Galatz, 15 miles lower down.

From Galatz to the sea the navigation of the river, the dredging, removal of obstacles, levying of tolls, etc., is controlled by an International Commission established by treaty in 1878, since which date great improvements have been made, chiefly in the lower reaches and the Sulina mouth of the river, by the construction of groynes, revetments, and cuttings to avoid the bends, and constant dredgings by powerful dredgers are carried on. The result of these works, chiefly carried out by English engineers, under the direction of Sir Charles Hartley, is that the main channel has been deepened from 8ft. at low water to from 16ft. to 20ft. at average low water, and vessels of 2,000 tons can now steam up to Braila in perfect safety. The necessity for this dredging will be apparent when it is borne in mind that the Danube carries to the sea annually solids in suspension sufficient to cover an area 10 miles square 9ft. thick.

Before 1847 about 50 British vessels annually entered the Danube; from 1847 to 1860 the number increased to 2,650, and from 1861 to 1889 the number was 12,363, with a tonnage of near ten millions.

British ships pay 75 to 80 per cent of the tolls received.

At Sulina, in 1894, 3,250,000 quarters of grain were shipped, and from the river ports over 8,000,000 quarters—in all from the Danube, 11,250,000 quarters, or 2,400,000 tons.

The promoters, engineers, and all connected with this grand improvement in the natural water facilities of this important river are to be congratulated on the successful completion of this great undertaking, and all must hope that it will prove as great a blessing to the progressive countries on its borders as it undoubtedly will to the rest of the world.

"YAMAN: ITS EARLY MEDIEVAL HISTORY." By NAJM AD-DIN 'OMARAH AL-HAKAMI. Also "THE ABRIDGED HISTORY OF ITS DYNASTIES." By IBN KHALDUN. And "AN ACCOUNT OF THE KARMATHIANS OF YAMAN." By ABU ABD ALLAH BAHÄ AL-DIN AL-JANÄDL. The original texts, with translation and notes by HENRY CASSÉLS KAY, M.R.A.S. London: Edward Arnold. 1892. Price 17s. 6d. 360 pages, with general and geographical indexes and map, followed by the original text.

THIS most interesting, historical, and geographical work has been presented to the Library by Alderman Galloway, J.P., of Preston. Those who have read Harris's Yaman will be pleased to follow up their study of that interesting but little known part of Arabia by referring to this volume. It is not an easy book to read, but the difficulties are not great, and the veil is raised from a most fascinating historical study.

NOTES OF AN ADDRESS ON THE SALFORD MUSEUM,
PEEL PARK.

By MR. BEN H. MULLEN, M.A. (Dub.), F.A.I., Curator.

[Addressed to the Members in the Museum, May 26th, 1897, at 3 p.m.]

THE members of the Manchester Geographical Society visited the Museum, at Peel Park, Salford. They were met by the Curator, who conducted them round the collections. On the stairs their attention was drawn to the fine reproductions of Assyrian sculptures, the originals of which are in the British Museum, and came from Nimrud. They date from about 820 B.C. In Room A are arranged the Industrial Collections. Here the cotton exhibit was taken as a sample of the method of arrangement of all. This group commences with the raw cotton as it is gathered from the trees on the plantations, and examples of over two hundred kinds are shown. One of these is selected, and the entire process through which the fibre passes in the various machines is fully illustrated both by descriptive labels and by examples showing the result of each process. Then, numerous specimens of finished cotton fabrics are shown; and a clear notion of the extent and usefulness of cotton in man's service is impressed upon the visitor. Following on this are other sub-sections, showing the processes of manufacturing woollen and silk materials, cards, wine-glasses, thimbles, needles, papers, leathers, etc. In this gallery are arranged upon the walls several interesting portraits of eminent men, principally local celebrities. They have been recently cleaned and restored, and now look their best.

In Room B are exhibited the principal Art Collections. Here are many pictures of which the borough may be pardonably proud; and also a number of original marble sculptures, unequalled both in beauty and in number by any provincial gallery we have ever visited. In this room are also placed most interesting collections of pottery and porcelain, fully described by their labels. And here, also, are the collections of objects of *vertu* lent by the South Kensington Museum, and chosen from among their treasures by the local authorities. Great improvements have been effected since the occasion of the Society's last visit; and perhaps the most striking is that of the restoration of so many of the valuable paintings and the gilding of their frames.

In Room C were described the weapons and utensils of various savage nations scattered over the world; and these form a collection of specimens which it would be difficult to match in this district for interest either in themselves individually or in their relations one to another. In this room are also a number of pictures which, as well as others in the galleries, were described by Mr. Mullen.

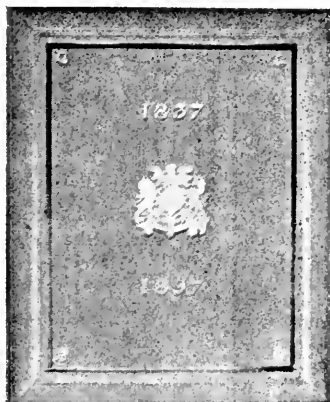
Proceeding to the Geological Collections, those who were interested in that science wandered from case to case among the interesting specimens therein exhibited. The Curator informed his visitors that this section had been completely reorganised by Mr. Herbert Bolton, F.R.S.E.; that a Handbook had been written by Mr. Bolton describing it; and that he himself had completed two Handbooks—Fine Arts and Ethnographical—which had not yet been received from the printers.

The members were impressed with the evidence of care that is devoted to all the collections under Mr. Mullen's control, to their excellent arrangement and descriptions, and to the cheerfulness and cleanliness of the entire building and its contents.

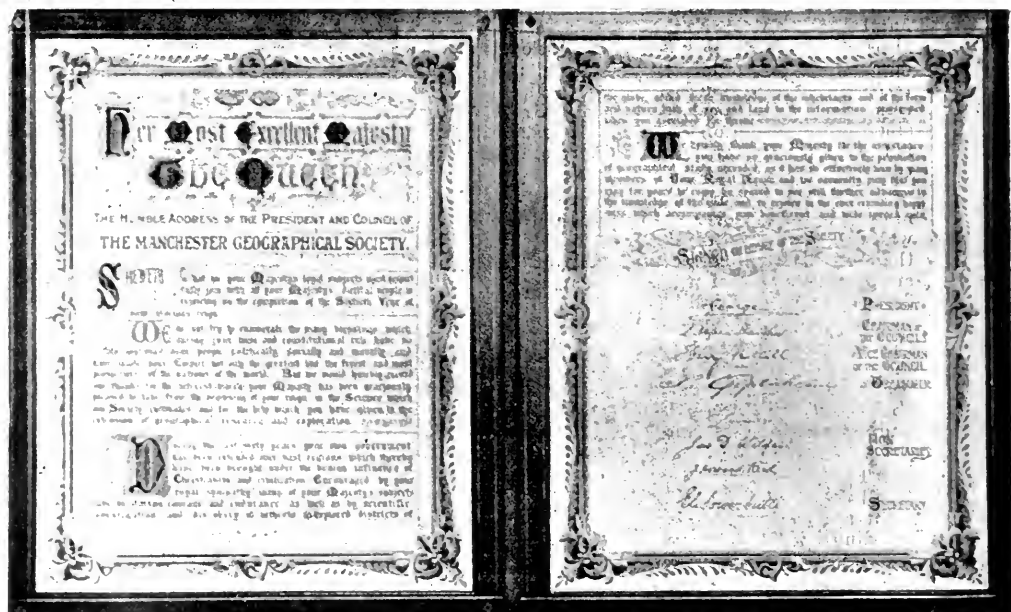
A hearty vote of thanks was tendered to Mr. Mullen for his addresses on the various collections in the Museum.

THE DIAMOND JUBILEE OF HER GRACIOUS MAJESTY THE QUEEN.

The Society sent an address to Her Gracious Majesty the Queen on the occasion of her Diamond Jubilee. The address was beautifully written by Mr. Thos. Oliver, of King Street. It was written on vellum, with borders in colours and gold, and was bound in blue morocco, gold tooled.



18in. x 15in.



The Diamond Jubilee of Her Gracious Majesty the Queen. 117

The address read as follows :—

TO HER MOST EXCELLENT MAJESTY THE QUEEN.

The Humble Address of the President and Council of the Manchester Geographical Society

SHEWETH—

That we, your Majesty's loyal subjects, most respectfully join with all your Majesty's dutiful people in rejoicing on the completion of the 60th year of your glorious reign.

We do not try to enumerate the many blessings which, during your wise and constitutional rule, have so richly improved your people politically, socially, and morally, and have made your Empire not only the greatest but the freest and most prosperous of the nations of the world. But we would humbly record our thanks for the interest which your Majesty has been graciously pleased to take, from the beginning of your reign, in the science which our Society cultivates, and for the help which you have given in the extension of geographical research and exploration.

During the last 60 years your own government has been extended over vast regions, which thereby have been brought under the benign influence of Christianity and civilization. Encouraged by your royal sympathy, many of your Majesty's subjects have, by daring courage and endurance, as well as by scientific investigation and discovery in hitherto unexplored districts of the globe, added fresh knowledge of the inhabitants and of the form and nature both of sea and land to the information possessed when you ascended the throne.

We humbly thank your Majesty for the assistance you have so graciously given to the promotion of geographical study, seconded, as it has so effectively been, by many members of your Royal House, and we earnestly pray that you may for years to come be spared to see still further advances in the knowledge of the globe, and to rejoice in the ever-extending happiness which accompanies your beneficent and widespread rule.

Signed, on behalf of the Society,

GEORGE, *President.*

S. A. STEINTHAL, *Chairman of Council.*

HARRY NUTTALL, *Vice-Chairman of Council.*

S. OPPENHEIM, *Treasurer.*

F. ZIMMERN,
J. D. WILDE,
J. HOWARD REED, } *Hon. Secs.*

ELI SOWERBUTTS, *Secretary*

The following reply was duly received :—

B21471D

1993.

Whitehall,

3rd September, 1897.

SIR,

I have had the honour to lay before The Queen the loyal and dutiful Address of the Manchester Geographical Society on the occasion of Her Majesty attaining the Sixtieth year of Her Reign, and I have to inform you that Her Majesty was pleased to receive the same very graciously.

I have the honour to be, Sir,

Your obedient Servant,

The Secretary

Manchester Geographical Society,
16, St. Mary's Parsonage, Manchester.

M. W. RIDLEY.

CORRESPONDENCE.

CENTENARY OF INDIA.

CENTRAL EXECUTIVE COMMITTEE.

Dear Sir,—We have the honour to inform you that the postponement of the celebration of the Fourth Centenary of the discovery of the maritime route to India, by Vasco da Gama, from July, 1897, the anniversary of his sailing from Lisbon, until May, 1898, the anniversary of his arrival at Calicut, having been rendered necessary, in consequence of the shortness of time and for other reasons, it has been decided to await further decisions of Parliament, which meets early in January.

Our Committee, authorised by the Portuguese Government, will duly communicate to you the precise date of the celebration and any alterations in the programme that may be decreed by Parliament, and we trust that we may continue to rely upon your valued support, in order that the results of our undertaking may be in harmony with the remarkable feat of universal history which the Portuguese Government desires thus to commemorate.

Central Executive Committee of the Fourth Centenary of the
Discovery of India, Lisbon, 26th October, 1896.

F. J. FERREIRA DO AMARAL, President.

LUCIANO CORDEIRO,

ERNESTO DE VASCONCELLOS, } Secretaries.

Chief Weather Bureau, Brisbane,

August 5th, 1897.

MY DEAR SIR,—I have duly received the Journal of your Society, April to June, 1896, together with copies of my paper, for which I beg to tender my sincere thanks. I have not forgotten my promise to send you some aboriginal weapons, and in due course, all being well, you will receive them. I shall never forget the pleasant time I spent with you and the exceeding kindness and hospitality with which you received me. I trust to have the pleasure of meeting you again in the year 1900, or, if not then, in 1901. Although I do not like to promise, I hope to be able to send you a few geographical or meteorological notes occasionally for the Journal.

With best wishes to yourself and the members of the Society,

Believe me,

Yours faithfully,

CLEMENT L. WRAGGE, Government Meteorologist;

Director of Chief Weather Bureau,

Brisbane.

ELI SOWERBUTTS, Esq.,

Secretary, Manchester Geographical Society,

Manchester.

P.S. Since writing the above I have carefully looked over my paper and have found one or two mistakes. I beg to send by this mail a corrected copy, and ask that in the form of "errata" you will be so kind as to make the correction in your next issue.

C.L.W.

ERRATA.

Page 128, line 1, insert "Australia" instead of "Queensland."

Page 128, line 28, insert "Walkerville" instead of "Walgerville."

Page 128, line 29, insert "himself" instead of "Gimo."

Page 134, line 21, insert "90 per cent." instead of "90 degrees."

Page 135, line 47, insert "officials" instead of "offials."

NEW BOOKS.

"FRIDTIOF NANSEN, 1861—1893." By W. C. BRÖGGER and NORDAHL ROLFSEN. Translated by WILLIAM ARCHER. With eight full-page illustrations, forty-six illustrations in the text, and three maps. 386 pages and index. London: Longmans, Green, and Co. 1896. Price 12s. 6d.

THIS is an interesting book from the insight given to the moulding causes of the character of Dr. Nansen. His ancestry is dealt with, and his early surroundings described and illustrated, and his work at Bergen, Naples, and Greenland, all preparatory to his last great work, is made known, and his scientific attainments are fully brought into view. Portraits are given of his father and mother, and several of himself and of his wife and little daughter. Chapter XIII. will be a favourite one with a good many readers, as it contains all an outsider could tell of his love-making and his acceptance. The book is full of information of a kind often wanted to complete the full figure of the intrepid explorer, and yet of a kind which he could hardly be expected to give himself. The style of the book is not ours, but notwithstanding that it compels attention. The translation has been accomplished by Mr. Archer, and it is a handsome book.

"ICE-BOUND ON KOLGUEV. A Chapter in the Exploration of Arctic Europe." By AUBYN TREVOR-BATTYE, B.A., F.L.S., F.Z.S., Etc., Member of the British Ornithologists' Union. With illustrations and three maps. Large 8vo. 450 pages. Price 21s. London: Archibald Constable and Co.

MR. TREVOR-BATTYE is an accomplished naturalist, and we have been favoured with an account of his earlier work, which was printed in a previous Journal, and this is an account of the first exploration by any Englishmen of the large island of Kolguev, which lies off the coast of Arctic Europe—the only island in that part of the Arctic Ocean—known as Barent's Sea. Mr. Trevor-Battye voyaged there in the summer of 1894, in a little yacht, which, through risk of Polar ice, was compelled to return, leaving him and his companion alone on the island, which was not known to be inhabited. After many adventures the explorer fell in with a party of the half-savage Samoyeds; and with them these Englishmen lived for three months—until, in short, they were relieved and brought across to North-Eastern Russia by a solitary trader bartering for furs. The book describes in vivid language this wild native life. It treats of hunting, of reindeer, of sacred and sacrificial mountains, and of a hundred quaint and curious interests of this remote nomadic race. Mr. Trevor-Battye's object was a scientific one; and to the story of his adventures he has added chapters of great value as a contribution to Arctic scientific research. These chapters are devoted to Ornithology, Flora, Geology, the native language, and kindred subjects, with sketches by the author and illustrations by J. T. Nettleship and Charles Whymper, and three maps. The volume is most interesting, and throws a good deal of light on the winter life of the Arctic Islands.

"CRAGS AND CRATERS: RAMBLES IN THE ISLAND OF REUNION." By WM. DUDLEY OLIVER, M.A. 27 illustrations and Map and Index. 214 pp. Price 6s. London: Longmans, Green, & Co. 1896.

THIS is a most interesting account of this French island, with historical summary and general description, and with detailed descriptions of the author's climbs and rambles. A very clear idea of the island is given, and the description is very much assisted by the pictures and the map. It is to be noticed that the island, as a colony, is represented in the French Chambers.

"FÜHRER FÜR DEN AUSWANDERER NACH BRASILIEN." VON A. PAPSTEIN. Berlin, W.: G. Meinecke, 10, Deutscher Kolonial Verlag.

THIS small pamphlet of 83 pages is a model guide for an emigrant who has made up his mind to face the difficulties and trials which he will inevitably meet, and which are very clearly and emphatically described by the author. It contains a very good description of the country, its climate, and its products; gives a brief account of methods of living, and advises those who intend to settle in the great South American republic as to their outfit and preparations for their journey. The book makes no claim to scientific value, but as a practical aid to emigrants it is excellently written. In an appendix it gives the German law regarding emigration, and is illustrated by a map of Central and Southern Brazil, which gives as much information as a map on the scale of 1:10,000 can do. The date of publication is nowhere mentioned, but from internal evidence it must have been written in 1896.

"ASIA, VOL. I., NORTHERN AND EASTERN ASIA." By A. H. KEAND, F.R.G.S., etc. 528 pages, 8 maps and 90 illustrations, and index. Price 15s.

"ASIA, VOL. II., SOUTHERN AND WESTERN ASIA." By A. H. KEAND, F.R.G.S., etc. 526 pages, 7 maps and 89 illustrations, and index. Price 15s.

"STANFORD'S COMPENDIUM OF GEOGRAPHY AND TRAVEL." (New Issue.) London: Edward Stanford. 1896.

THESE two volumes make a complete and satisfactory account of "Asia," rewritten by Mr. Keand, and rearranged. They are very well done, the information is so given that comparisons are possible; the illustrations are sharp and clear, and the maps have been redrawn and brought down to date. They form two volumes of Mr. Stanford's admirable new series, and in the space at the command of Mr. Keand all the information on geography, history, productions, commerce, and the statistics of the various states has been given. The books of the first edition, founded on a German basis, were, for their time, books of great value, but in rewriting them Mr. Keand has very much improved them, and as books of reference they are now of great value. Mr. Theodore Bent, Sir Martin Conway, the Right Hon. G. N. Curzon, Lord Dunsmore, Dr. Lausdell, and other recent travellers have been laid under contribution. The chapters are Caucasasia, Russian Turkestan, Siberia, the Chinese Empire, Japan, Afghanistan and Baluchistan, The Indian Empire, Indo-China and Malacca, Asia Minor, The Euphrates and Tigris basin, Syria, and Palestine, Arabia, and Persia. Introductory chapters and prefaces are given, in which are indicated some of the sources of information. The books are handy in size, and are printed in an easily-read type. They are books which should have a large sale.

"HISTORICAL ATLAS OF MODERN EUROPE FROM THE DECLINE OF THE ROMAN EMPIRE: Comprising also Maps of Parts of Asia and of the New World connected with European History." Edited by REGINALD LANE POOLE, M.A., Ph.D., Lecturer in Diplomatic in the University of Oxford. Oxford: The Clarendon Press. 1897. Each part Price 3s. 6d.

THIS Atlas was projected more than five years ago by Messrs. W. and A. K. Johnston, of Edinburgh, who invited Mr. Reginald L. Poole to undertake the Editorship. It is the first work of its kind produced in this country, and has been drawn up on the general lines of the well-known work of Spruner and Menke, but on a somewhat smaller scale. Its special feature is a series of seventeen maps illustrating the historical geography of the British Isles with a completeness never before attempted. But the foreign maps also represent a revision, and to some extent a simplification, of existing maps: a large number of them may claim to rank as original contributions, and almost all have characteristics which distinguish them from those to be found in other Historical Atlases. It has been sought to combine clearness of presentment with a fulness of detail sufficient for the historical student, avoiding, however, an excessive crowding of names. The prefaces prefixed to the maps will be found to furnish a useful guide to their interpretation. The maps have been designed, and the explanatory letter-press written, by scholars who are recognised authorities on the subjects dealt with. They will be about ninety in all, and are drawn and printed by Messrs W. and A. K. Johnston. The Atlas will be completed in thirty monthly parts, and the contents of the first ten parts are:—Part I., Map 2, Europe, 395-527, by Professor Bury, Litt.D.; Part I., Map 15, Roman Britain, by F. Haverfield, M.A.; Part I., Map 44, The Swiss Confederation, by the Rev. W. A. B. Coolidge, M.A. Part II., Map 19, Anglia Sacra, showing the Ecclesiastical Divisions in the time of Edward I., by C. Oman, M.A.; Part II., Map 29, Ireland prior to the Anglo-Norman Occupation, by Goddard H. Orpen, B.A.; Part II., Map 58, France under the Ancien Régime, by Walter E. Rhodes, M.A. Part III., Map 23, England, showing the Parliamentary Representation before 1832, by Professor Prothero, Litt.D.; Part III., Map 25, Scotland, c. 1300, by G. Gregory Smith, M.A.; Part III., Map 32, The Frankish Dominions in Merovingian Times, by the Editor. Part IV., Map 1, The Roman Empire, c. 350, by Professor Bury, Litt.D.; Part IV., Map 20, England and Wales under the House of Lancaster, by James Tait, M.A.; Part IV., Map 30, Ireland under the Early Tudors, by Robert Dunlop, M.A. Part V., Map 21, Anglia Monastica, showing the Principal Religious Houses in the time of Henry VIII., together with the Dioceses formed after their suppression, by Miss A. M. Cooke, M.A.; Part V., Map 51, Scandinavia, 1658-1815, by R. Nisbet Bain, of the British Museum; Part V., Map 77, Western Asia under the Abbasid Caliphs, 780, by Stanley Lane Poole, M.A. Part VI., Map 26, Scotland, showing the Ecclesiastical Divisions during the Middle Ages, by G. Gregory Smith, M.A.; Part VI., Map 33, The Frankish Dominions in Carolingian Times, by the Editor; Part VI., Map 60, The Spanish Kingdoms, 1263-1492, by the late Ulick R. Burke, M.A. Part VII., Map 3, Europe, 565-720, by Professor Bury, Litt.D.; Part VII., Map 18, England in the time of Edward I., by Professor Tout, M.A.; Part VII., Map 49, Russia from the Accession of the House of Romanov, by R. Nisbet Bain. Part VIII., Map 34, Germany under the Saxon and Salian Dynasties, by the Editor; Part VIII., Map 56, France during the Hundred Years' War, by James Tait, M.A.; Part VIII., Map 62, The Spanish Kingdoms in the Sixteenth Century, by the late Ulick R. Burke, M.A. Part IX., Map 4, Europe in the time of Charles the Great, by the Editor; Part IX., Map 46, Hungary, 1526-1699, by R. Nisbet Bain; Part IX., Map 53, France, Lotharingia, and Burgundy in the Eleventh and Twelfth Centuries, by Walter E. Rhodes, M.A. Part X., Map 47, Poland and Lithuania before the Union of Lublin, 1569, by R. Nisbet Bain;

Part X., Map 54, Northern France in 1066, by James Tait, M.A.: Part X., Map 63, Italy in the Lombard Period, 568-774, by Professor Bury, Litt.D. This Atlas is of first importance, and is well done. The design is a large one, and perhaps the Clarendon Press are the only publishers who would have ventured to issue a work of this magnitude. We hope their enterprise may meet with great success, and that the Clarendon may thereby be encouraged in their good work.

"DR. HERM. BERGHAUS' CHART OF THE WORLD, showing the Regular lines of Steamers, principal Overland Routes, most important Sailing-vessel tracks, Sea-currents and Wind-zones, the Variation of the Magnetic Needle, the condition of Floating Icebergs, as well as the Telegraphic Cables round the Earth." Twelfth Edition. 1897. Completely Revised by H. HABENICHT and B. DOMANN. The Price of the Map in Sheets is 20 Marks.

THIS Map is so well done that the best way to make our members understand its value will be to print the Editors' description of the work:—"The foregoing lengthy title is of itself almost sufficient to indicate the aim of this Chart: viz., a rapid survey of the direction and destination of those winged messengers, which, by means of electricity, steam and sail, make communication possible between all parts of the world, by land and sea. The eleven previous editions of this Chart prove that it has supplied a long-felt want. It was received with unanimous appreciation, and every year is in greater request in all quarters of the globe. The Chart of the World contains information useful to all and every condition of life, whether for practical purposes or study. It is written in English, as being intelligible to all seafaring nations, but the Chart of the World is of equal importance to the sailor, the merchant, or the student, in cabin, office, or study. During the many long years Justus Perthes in his Geographical Institute in Gotha has been prevented by no less important tasks than this, from undertaking the necessary revision of this Chart, the need of such a Chart of the World has been keenly felt. To-day, however, in this 12th Edition, he offers a completely new work, for the corrections which the copper-plates have undergone are so numerous that they can indeed be called entirely new. By means of the corrections, the outlines and printing, the delicacy of the mountain curves and lines, and the numberless strokes and signs have greatly gained in clearness and distinctness. Also the great improvements which have lately taken place in coloured printing have been made the most of in these new maps. So that if the Chart of the World attracts the buyer by its exterior aspect, it completely realises on closer inspection his highest expectations. Maps of the world have this advantage over Atlases, that things to be compared can be placed next to one another, in a manner not otherwise possible, and thus all wearisome turning over and round about is done away with. In this respect the Chart of the World offers an especially exact and clear survey of Political States with their Colonies, and of course their topography agrees throughout with the latest discoveries. Quite recently numerous questions connected with boundaries have arisen, and the results have been shown in the map just before its being sent to press: as for instance, those in West Soudan, Zambesi, Abyssinia, the Plateau of Pamir and Further India. Especially to be observed is the new administrative division of the Dominion of Canada as yet hardly known. In higher latitudes, viz., in Siberia, Arctic America, Greenland, and Spitzbergen the scale of the Chart is large enough to give such an amount of information that no Atlas can be compared to the Chart of the World for its contents. Shortly before its publication it was found possible to give Jackson's surveys in Franz Josef Land, Nansen's newly discovered islands on the North-west coast of Siberia, and the result

of the recent Russian surveys of the Mouths of the Ob and Jenissei. Since the publication of the former editions time has brought about enormous changes in the intercourse of one world with another. Only to mention one instance, note the feverish haste with which the present Siberian railroad is being laid down. This is given with perfect exactitude in the map, while the Manchurian railroad can be clearly traced by means of the settlements. Some day or other the length of time it now takes to go round the world will be shortened by one half. Among the most important railroads the connecting junction between the principal towns and harbours can be distinguished by the colouring. Great attention has been paid to the frequent repetition of names, the number of these having greatly increased, viz., in Norway. Measurements of heights above sea-level (in metres) are frequently given in this map, besides information of the most varied kind: German and English Consulates; coaling-stations and docks; the extent of river-steam navigation; waterfalls and rapids; places in the islands of the southern Pacific and Indian Oceans where stores of food and clothing for the shipwrecked may be found; the Treaty-ports now open to European; in China, Japan, Corea, etc. Still more important are the directions given by the Chart of the World on unstable ground—the sea. Professional seamen find thus a help to be depended upon, and travellers an able adviser. With reference to this part of the subject, the map of the Three Oceans (the Atlantic, the Pacific, and the Indian) published by the Honorary Councillor of the Admiralty—Dr. G. Neumayer, Director of the German Hydrographic Department, was of the greatest value in the compilation of the Chart, as well as the Pilots' Chart of the North Atlantic and Pacific Oceans, published by the Hydrographical Office in Washington, under the superintendence of the great Hydrographer Sigsbee. The result of the numerous notes and experiments made by the best sea-captains and officers during the last decade are here summarised. Whereas earlier editions of the Chart of the World showed a coloured tangle of lines followed by certain steamers, the 12th Edition gives for the first time, and in fact as the first Chart of the World, the best, nearest, and most advantageous routes taken by steamers as well as sailing vessels, and divides these last according to the seasons of the year. The lines followed by steamers undergo yearly changes—in the North Atlantic Ocean on account of the Newfoundland icebergs floating south, and in the Indian Ocean on account of the North-east and South-west Monsoons. The routes of the great Ocean liners are traceable by means of eiphers and letters, so that one can see at a glance the number and nationality of the mails running on that line, as well as the most important harbours at which they stop. At the bottom of the Chart there is a list of these steamers with their corresponding numbers, continent, and nationality, ports from which they start, and those to which they go, also the principal ones on the route the distance in marine miles, as well as the frequency and duration of the voyage. Thus by its simplicity, clearness, and reliability it has attained the highest possible standard. This list of steamers is printed separately, so that current changes in the course of the liners can be inserted into it whenever necessary. By this means each fresh copy of the Chart as it appears on the market contains the latest corrections. Among others, the new Japanese routes by way of Odessa, Australia, and San Francisco are to be found in the list and on the Chart. The communication along the coasts and in inland seas has also been noted; the summer trips of Norwegian, English, and German Steamers to the Summer Hotel in Advent Bay in the Ice-Fiord in Spitzbergen are shown in the Chart. The two most divergent routes followed by sailing vessels in July and January are given in order that those followed during the intervening months of Spring and Autumn may be easily deduced. The colour of the tracks followed by sailing vessels is the same as that of the outlines of the Tradewinds, varying with the seasons of the year. The limits of the Wind and Calm Zones marked in the map refer either to July or January—Mid-Summer or Mid-Winter. An additional map for the general survey of Sea-winds gives the Zone-limits as they are in Spring and Autumn. Further information is given by showing the cold and warm sea-currents, with their rate of speed; conditions of floating icebergs (details as to the

direction in which these drift have most probably never been given so completely before), sea-weeds, and the indispensable magnetic needle for the horizontal and other variations of the year 1895. To facilitate the finding out and entering of one's position, or to map out the vessel's course, the division of the degrees is shown by a finely-traced line for every two degrees. The several indicators drawn on the Chart are there to facilitate the finding out and registering of the points of the compass. As for depths of the sea, besides shoals, cliffs, reefs, etc., we have given the 200 metre line, because it is the utmost limit at which waves can be affected by the bottom of the sea, even in high storms. The Telegraphic Cables, whether communicating with the most inland parts of Continents or with the most distant seas, are given in an additional map. And another map in polar plane globular projection gives a survey of the principal routes for voyages round the world."

"FARTHEST NORTH." By FRIDTJOF NANSEN. Being the Narrative of the Voyage and Exploration of the "Fram," 1893—96, and the Fifteen Months' Sledge Expedition by Dr. Nansen and Lieut. Johansen; with an Appendix by OTTO SVERDRUP. About 120 full page and numerous text illustrations. Sixteen coloured plates in facsimile from Dr. Nansen's own sketches. Portrait, photographs, maps, and index. 2 vols. 8vo., 1,182 pages. 42s. Archibald Constable and Company. 1897.

THESE two handsome volumes, issued by Messrs. Constable and Co., are Dr. Nansen's account of his expedition, and they possess not only the greatest scientific value, but they are a thrilling narrative of adventure. The author has presented a graphic picture of life in hitherto unexplored regions, in a simple and direct form which will appear to all classes of readers. The fifteen months' sledge expedition is one of the most remarkable feats of physical endurance that the world has witnessed. As a man of science Dr. Nansen propounded a plan for attacking the fastnesses of the Arctic, the unconventional boldness of which provoked the opposition and ridicule of part of the scientific world. His theories seemed to be wild speculations, yet he has demonstrated the truth of some of the views he foreshadowed, and he has accomplished a great deal of that which he attempted. Modestly as the author has presented himself and his work to the reader, a perusal of the book proves him to be an explorer, sportsman, scientist, and artist of the first rank. The illustrations of these two volumes, from photographs and drawings by Dr. Nansen himself, form an authentic and graphic record of the whole expedition, the special feature of them being a series of sixteen very beautifully printed plates, in colours, reproduced in fac-simile from sketches made on the spot in water-colour and pastel. The interest in the great achievement of Dr. Nansen and his colleagues is intensified in reading this plain story. And none can read it without being impressed with the fine personality of the Doctor; whilst a chord of sympathy is struck for his brave, waiting wife and child. The story of the poor dogs is most pathetic, and we do not wonder that Nansen and his fellow voyagers could not kill their own when the stern necessity arrived. The scientific results must take a large amount of time to work out, and probably in a year or two we may have them issued to us. In the meantime some deductions as to the Arctic, which have been hastily made, may have to be revised, and it is well to remember that we shall have in the course of a year or two, from other expeditions, some light thrown on parts of the great problems Dr. Nansen and his brave companions set themselves to solve.

THE JOURNAL

OF THE

MANCHESTER GEOGRAPHICAL SOCIETY.

THE SHETLAND ISLANDS.

(See Map.)

By MR. E. J. RUSSELL, B.Sc.

[Addressed to the Members in the Library, Monday, March 22nd, 1897, at 7-30 p.m.]

IT is probably still a common idea that the Shetland Islands are a part of the British Empire, exceedingly out of the way and very uninteresting when you have got there. This is, however, not so, as we hope to be able to indicate in this paper. The Shetland Islands are easily accessible from Leith or Aberdeen, and the sea voyage can be done in 16 hours. The passage is certainly sometimes rough, but as a rule one is very agreeably surprised to find how much smoother it turned out than one had anticipated.

Undoubtedly the finest way of getting to the Shetland Islands is to go by boat from Liverpool. The boat calls at several places on the west coast of Scotland, and the lochs are seen to great advantage. It is necessary to change at Stromness, Orkney, where a few days may be very pleasantly spent among the magnificent rock scenery on the coast going northwards, and the very interesting, and probably unique, archaeological remains.

There is a good service of boats between Orkney and Shetland, and the voyage takes 8 or 10 hours. About mid-way is Fair Island, a barren little place, surrounded by rocky cliffs and frequently altogether inaccessible. It has, however, figured in history, being the island on which one of the ships of the Spanish Armada was wrecked in 1588. The Spanish Armada is much talked about both here and in Shetland, and one is frequently told that the Fair Isle knitting and dyeing was taught by the shipwrecked Spaniards.

The Shetlands are a group of about 100 islands, nearly 30 of which are inhabited. Though in the same latitude as Cape Farewell, in Greenland, they are not at all cold, as they lie on the northern branch of the Gulf Stream. The most southerly point of the islands is about 110 miles from the Scotch coast, and the most northerly is nearly double that distance.

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We are here getting into the land of the midnight sun. At midnight in the summer golf is played, photographs can be taken, and even a newspaper can be read without difficulty. In the winter the day is more than two hours shorter than ours, but the nights are brightened by the aurora borealis or merry dancers, as they are locally called, which fill the heavens with their beautiful soft light, and emit a faint crisping sound. A display of the aurora borealis is supposed to precede some ill fortune.

When one first sights the islands one is struck by the utterly barren appearance. There are no trees and very few fields, nothing but heather and moss. The sea has cut out deep inlets called voes or bights, and has washed away the softer parts of the rocks, leaving the harder parts to assume very fantastic and beautiful forms. On the cliffs are found thousands of water-fowl, gulls, guillemots, cormorants, etc., and even in some places, the white eagle, the bonxie or skua, and the immer goose, birds which were fast being exterminated before the Wild Birds' Protection Act was passed.

HISTORY.

The earliest inhabitants are called Picts, it is said they came hither from Scotland. But the Fins and Laps figure in Shetland legends, and it is possible there were also some of these. The "Picts" have left some remains behind them; there is evidence to show that the numerous brochs scattered about the islands were built by them: a few Pictish houses have been discovered, and apparently the Norse word for Pict occurs in some place-names, but they have left no place-names of their own. A race of Celtic missionaries, said to be disciples of St. Columba, worked among these Picts before the Norse days. They left behind them the name Papa, which we find in the group, besides crosses and other symbols of Christianity.

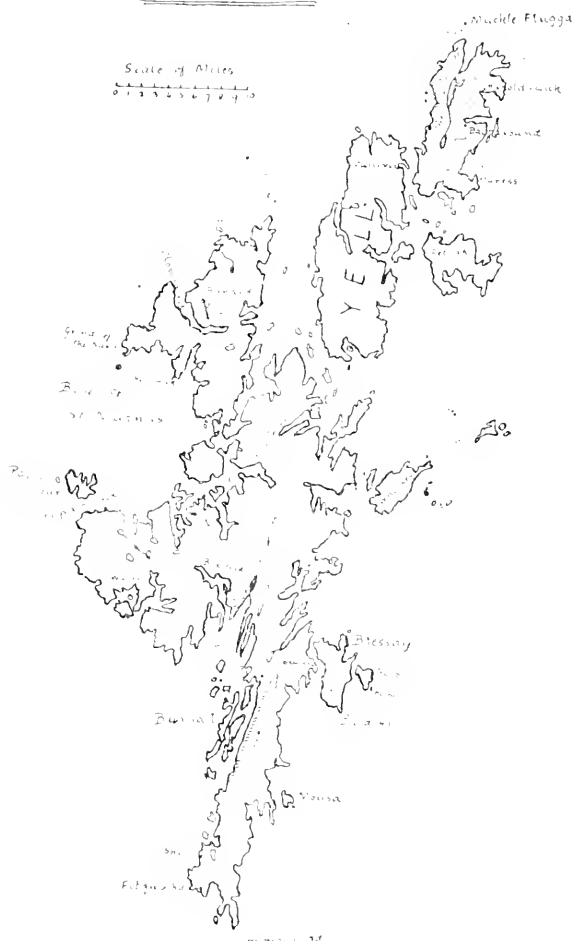
In 870, when Harold Haarfager, or the fair haired, became master of Norway, many of the udallers, or freeholders, who refused submission were deprived of their lands, and fled to these islands and to Scotland, and took vengeance by harassing Norway as much as possible. Harold landed with an army at Haroldswick in Unst and subdued all the islands, leaving them in charge of an Earl or Jarl named Rognvald. It was in this way that the Norsemen came to Shetland, and here they stayed; and to this day the inhabitants are Norse, and the place-names, customs and general characteristics of the people are also Norse, and very many Norse words are still in common use.

For 400 years the Norse earls ruled over Shetland. During this period the Norse love of constitutional government was allowed to develop freely, and Hibbert, who is the historian of the Shetland Islands, gives a very interesting account of the Norse laws. The municipal laws were framed at a general convocation of the householders which was held in the law-ting. Each small district had its council which managed the local affairs and appointed the Rancelmen, who, among other duties had to inspect the manners of others, to prevent domestic quarrels and scoldings, to find out who stayed away from church, and to try the merits of sheep dogs. The legislation was grandmotherly to a degree.

Right up till the eleventh century the old Norse religion was the

religion of Shetland, but somewhere about 1000 A.D. the inhabitants were converted to Christianity by their king Olaf, King of Norway, according to the ancient method when one had to choose between baptism and death. The real conversion to Christianity did not come till more than 100 years after.

S H E T L A N D



It was in 1468 that Shetland was annexed to Scotland. Norway had ceded some islands to Scotland in return for an annual payment of 100 marks, but for 26 years the money had not been paid. A settlement was effected by James III. of Scotland marrying Margaret of Norway, and receiving with her quittance of his debts and Orkney and Shetland

in pledge for a dowry. The dowry was never paid, and Orkney and Shetland remained British property.* The islands being in the first instance a pledge, the internal government was naturally not much disturbed, and the ancient mode of legislation continued up till 1670. But one of the Scotch earls, Patrick, taking advantage of his distance from the Court, forcibly dispossessed the freeholders of their property, using all the cruelty and oppression of the feudal times. His castle still stands at Scalloway, and his name is still remembered by the people and is spoken of with great bitterness. Patrick took measures to prevent any news of his doings from reaching the king, but they were not successful, and Patrick was recalled and beheaded. A more constitutional way of government was introduced, but the people were still ground down very much, though they do not seem to have rebelled openly. The consequence was they were very much demoralised, and even as late as 1839, when Ploven, a Dane, visited Shetland, and wrote a most delightful little book about his visit, he describes the people as surly, dishonest, inhospitable, cringing to superiors, and generally depraved.

THE COAST.

The finest scenery in Shetland is undoubtedly that of the coast, and steamers periodically make a tour of the islands. For those who have not much time at their disposal this tour, together with a few days spent on shore, is sufficient to obtain a fair idea of what Shetland is like. A long stay is, however, very enjoyable, and headquarters may be comfortably made at Lerwick, the capital, and by far the most important place. A glance at the map shows its admirable situation, and in fact its harbour is one of the finest in Great Britain. During the last century the Dutch herring boats used this harbour very largely, and it was owing to the trade done with these boats that Lerwick rose from an insignificant hamlet and finally outstripped the ancient capital Scalloway. Some of the trade with the Dutch boats was of an illegitimate kind, and many are the yarns which some of the older fishermen can tell about the old smuggling days and the various ways adopted to outwit the six Customs officers stationed at Lerwick. Many of the oldest houses are built right in the water and have doors opening to the sea, a circumstance which would be very favourable for the smugglers.

The chief street in Lerwick is Commercial Street, a very long, narrow, winding street, so narrow that no carts can pass along it—there is no pretence at a roadway—and so winding that you can never see very far in front of you. Every one seems to have built his house just how he liked and just where he liked. On a hill above this street, however, a number of villas have within the last few years been erected, and the visitor will probably find it much more comfortable to take rooms in one of these villas than to stay at a hotel. Until recent years the few of the better class people who lived at Lerwick had to inhabit the fort because of the lack of suitable houses.

Bressay is the island opposite Lerwick, and we can get there either by means of the steam launch "Kate," or else in a little smack. The

* Shetlanders always speak of the islands having belonged to Denmark. This is accounted for by the fact that at the end of the 14th century Norway entered into a union with Denmark, and Denmark becoming the predominant partner the property of the Union was looked upon as the property of Denmark.

"Kate" is advertised to run daily, but if the weather is rough or if the skipper has been persuaded by a party of tourists to go elsewhere, the "Kate" does not go to Bressay. The smack always goes, however, as it carries the mails and the milk. Sometimes gales blow with great fury round these islands, and the more distant ones would often be left for long periods without any visitors, were it not for the mail contracts. Fishing smacks are subsidised, and undertake to go every day to the nearer islands and once a fortnight to those further off (Foula and Fair Isles) to carry mails, no matter what the weather is like. A Shetland fisherman has no fear of the sea, and these little smacks gallantly put out even in the roughest weather to fulfil their contracts. If the storm beats them back, they try again and again till at last they succeed. There is a good deal of heroism displayed even now in the carriage of Her Majesty's mails, perhaps as much, though of a different sort, from that of the days of the French wars.

Bressay is $2\frac{1}{4}$ miles wide and six miles long. The part opposite to Lerwick is fairly well sheltered so that cultivation is possible, and from Lerwick the island looks very pretty. On the south and east coasts the cliffs are very fine, though only in two places do they rise above 400 feet. The names of the cliffs and creeks are all Norse. There is a very pretty natural arch and some fine blowholes, and the lover of rock scenery will be able to spend many hours in exploring the cliffs. There is also a cave which should be seen, called the Orkneyman's cave, which has to be explored in a boat as the floor is under water. One first goes into a large cave, this rapidly dwindles down to a narrow winding passage; stalactites hang down from the roof, and the rocks at the side have been very much worn by the sea. As viewed in the torchlight the appearance is very weird. What the old name of the place was I cannot find out; it takes its present name from an Orkney man who was flying from the pressgang, and hid there on one of the ridges. His boat got adrift, and for two days he was a prisoner. He ultimately escaped by swimming out and climbing the cliff.

Close by this is the Giant's Leg, a huge buttress standing off from the cliff called the Bard. The word "bard" signifies a cliff with the top projecting above the base: it also means giant. Bressay is most probably a corruption of Bardsey, a form which is preserved in an island in Carligan Bay, and means the Giant Island. The terminations ey, ay, a, oe, represent a Norse suffix used for an island of the second magnitude, (Bressay, Whalsay, Faroe). An island of the first magnitude would be called a land, as Iceland, Shetland; and one of the third magnitude a holm, as Door Holm. It will be seen that there is an island called Noss lying just off the east coast of Bressay; it is only a very small one and possesses but one house; seen from Bressay, it is simply the grassy slope of a hill, but when the summit is reached the hill abruptly terminates, and drops sheer down into the sea to a depth of 600 feet. It was probably on account of this magnificent cliff that the island received its name, Noss being the same word as Ness or Naze. On each side of this summit (called the Noup, which means the top of a mountain) the cliff's fall away, and about half-a-mile southwards, where the cliff is only 200ft. high, a tiny islet called the Holm stands just a few yards off; its sides are perfectly steep and also nearly 200ft. high, but the top is

quite flat, and grass grows on it. It is almost inconceivable that any one could ever climb up on to this islet, but there are a number of cases on record in the Shetland and Faroe Islands where cliffs as difficult or more difficult have been scaled. In 1660, a fowler succeeded in "boarding" the islet and threw a rope across the narrow channel separating it from Noss; on this a basket was slung called the cradle. He did not, however, return by the basket, but tried to climb back to his boat. He fell, and was killed. The "cradle" remained, however, and was used by fowlers, and sheep were also taken across to graze, though the very small area of the Holm could scarcely have made this worth the risk. Ploven, the Danish visitor previously mentioned, went across in this cradle as late as 1839, but some years ago a man was crossing in it and the bottom fell out, and though he managed to escape, the cradle was not mended and it has been recently removed; so the island is at present inaccessible.

Going northwards from Noss, in our tour of the island, we find very little rock scenery. We pass Whalsey, an island which has a dialect very different from that of the mainland, and the Skerries, a cluster of rocks sometimes covered with seals, which, however, quickly disappear when the steamer's horn is blown. The mainland and the islands are very barren, but still there is something very beautiful about their hills of heather and their long winding creeks. Further north we come to Yell, the second largest of all the islands, and perhaps the most desolate. On it are the ruins of eight broughs or Pictish castles and over twenty towers, which are supposed to have been either chapels or towers erected out of gratitude for deliverance from shipwreck. As might be expected in so lonely and desolate an island, the people are intensely superstitious, and when they can be induced to give their experiences with the "trowies" or ghosts the tale is weird and uncanny to a degree.

Passing Fetlar, one of the most fertile of the group, we come to Unst, the island first inhabited by the Scandinavians. About a mile to the north of this is the Muckle Flugga Lighthouse, put up in 1858, and showing a light visible for 21 miles. It is said that, with the exception of fishing boats, scarcely six vessels a year pass this lighthouse.

This is the most northerly point of the British islands, being on a level with Bergen in Norway and Cape Farewell in Greenland.

Many years ago gold was discovered on Unst, but the quantities turned out to be too small for profitable working. Baltasound, in Unst, is much frequented by tourists, owing to the excellent fishing in some of the neighbouring lochs.

Fishing is the chief attraction for the tourist in the interior of all of these islands. There are hundreds of lochs well stocked with trout, and many of them not fished. There is practically no other form of sport; a few snipe and plovers and hares, but very few. Attempts to introduce grouse turned out a failure, owing to want of shelter.

The population of Unst at the last census was 2,280, and in 1894 only five deaths were recorded, the youngest of the five being 78. Long life seems to be the rule in Shetland, and it is said that one-third of the inhabitants live to over 70. But it must be borne in mind that many of the young men and women emigrate as soon as they have

saved sufficient, so that the people "die abroad," as one of the natives expressed it.

Coming southwards, on the west side, we pass the narrow sound separating Unst from Yell, and that separating Yell from the mainland, which are exceedingly dangerous owing to their liability to sudden storms. In 1881 a number of fishing boats were caught and wrecked, and many of the fishermen drowned. In thinly populated districts like these such a disaster is felt for many years afterwards.

We pass North Main, which is almost, and sometimes quite, an island. Here is Roeness Hill, the highest hill in Shetland, though only 1,475ft. high. None of the other hills, however, come up even to 1,000ft. Shetland is almost entirely of Silurian slate, but at Roeness Hill and round the adjacent St. Magnus Bay there are large quantities of granite, and so we find in St. Magnus Bay, where the hard rock is exposed to the full fury of the Atlantic, some of the finest rock scenery in Shetland or, in fact, in the British islands. It is, of course, quite hopeless to attempt to describe rock scenery, and no photographs or pictures can give any adequate representation of it. Among the most striking features of this part of the island is the Grind of the Navir (*Grind-gate*), an opening made by the sea in a huge wall of porphyry. Such is the force of the storms that large stones, torn from the sides of the breach, are sometimes thrown to a distance of 180ft. The spray is often carried a mile inland. Of recent years the storms have begun to tell, and natural arches and fantastically shaped rocks that had for hundreds of years resisted the ocean—as is proved by their having accurately descriptive Norse names—have, within the memory of persons living, fallen victims to the power of the storms. *Apropos* of this corroding action which has of late become evident, it may be mentioned that some of the stones of the Druidical circles of Orkney have recently shown very rapid signs of wearing.

The Drongs, Door Holm, and the Gordie Stack are magnificent rocks which will not easily be forgotten by those who have seen them.

Leaving St. Magnus Bay we pass Papa Stour (Papa is a word commemorating the Celtic missionaries, *pap-wy* being Old Norse for "priest-isle" and *Stoor-big*), a very productive island, with some very fine caves and rock scenery. Continuing southwards we get a sudden change of scenery, and find ourselves in a beautiful bay dotted with islands and bounded by green sloping shores. There are no trees, however, and in fact we see no trees at all in our tour of the island. In this bay is Scalloway, the ancient capital of Shetland, a picturesquely-situated little village, where are the ruins of the castle of Earl Patrick, of whom we have already spoken. There is nothing of special interest in the castle, but the custodian does not fail to tell of the various tortures adopted by Earl Patrick.

Going still farther southward we find ourselves in the scene of Scott's "Pirate." Scott visited these islands in 1814, during a seven weeks' tour of the northern islands. It is sometimes said that Magnus Troil lived on Burra Island, but it seems pretty clear from the context that he lived on the mainland. Fitful Head is, as is now well known, disappointing after reading Scott's description of it. I believe it was Ploven who first pointed out that Scott's description is largely fictitious. It may be that

Scott only saw Fitful and Sumburgh Heads from the sea, and from the sea they both look very imposing. Off Sumburgh Head the conflicting currents form the "Roost," a part of the voyage which is usually very unpleasant.

The best centre for exploring this part of the island is Spiggie, where a hotel has recently been put up. The accommodation is good but rough, but there is excellent fishing.

Passing up the East Coast towards Lerwick we find comparatively little rock scenery. The most interesting place, and from an archaeological point of view the most important on the whole island, is Mousa (pronounced Mōōsa), an island on which is the most perfect of all the towers or brochs (pronounced "brochs") built by the Picts. Many maintain that the Norsemen built them, but the balance of evidence seems to be in favour of a Pictish origin. The tower is well described in the notes to Scott's "Ivanhoe." It consists of two concentric circular walls, each about 6ft. thick and 40ft. high, separated by a space about 6ft. wide. The external diameter is about 50ft., so that the courtyard enclosed by the walls is of some 14ft. diameter. The stones are laid on in perfectly regular courses, and no cement of any kind is used. There are no openings in the outer wall, excepting a very small doorway facing the sea. A winding stair between the two walls leads to the top: in ascending you pass several rows of apertures looking on to the courtyard, and also a number of apartments built into the inner wall.

Going nearer to Lerwick we pass Cunningsburgh, a village whose inhabitants seem to be quite different from ordinary Shetlanders. Similar settlements of a different race are occasionally found in other remote parts of Shetland. One is usually told that these people are Spanish, being descended from the shipwrecked Spaniards of the Armada, but they possess no Spanish characteristics. Occasionally people are pointed out who are undoubtedly Spanish, but it is much more probable that they are descendants of Spanish sailors, who settled here at the beginning of this century—for there was at that time a considerable trade in fish with Spain, and Spanish vessels frequently called at Shetland—than that they are descended from the Spaniards of the Armada. Dr. Jacobsen, of Copenhagen, who has spent much time in Shetland collecting what remains of the dialect and investigating the legends, place-names, etc., and who has embodied the results of his researches partly in two lectures recently published, inclines to the belief that the decidedly un-Norse people pointed out as Spaniards are in reality descendants from the races who held Shetland before the Norsemen came. It was not the practice of the Norsemen to exterminate the people they conquered, and there are no legends saying they ever left Shetland. Popular superstition has it they were changed into "trowies."

THE INTERIOR.*

We have already remarked that there are no hills of any magnitude in Shetland, that, in fact, there is only one which is more than 1,000 feet high; there is consequently no shelter, and the gales, which make the

* There are no railways in Shetland, but the roads are excellent. Those who do not cycle must either travel in mail gigs or hire traps.

magnificent rock scenery of the west, sweep over the islands and render the interior barren and desolate. Only about one-thirtieth of the area is cultivated. There are no trees, and all attempts to cultivate them have ended in failure. At Fladibister, about 10 miles south from Lerwick, there grow some wild roses which are pointed out as a natural curiosity. One of the natives in speaking of them to me said they formed "what in Scotland is called a hedge." In a few places trees, or more properly, shrubs, grow to the height of the wall which protects them.

The only grain that can grow is bere, but this so beaten down by the storms that reaping with a scythe is impossible, and it has to be cut down in handfuls with a sickle. This very tedious work is done by the women, who, however, do it so carefully that not a single reed is left. Hay has usually to be cut in the same way. Turnips will grow, but usually they have to be planted in very small patches, and have a stone wall set round so as to protect them from the wind. The interior is almost entirely one mass of peat bogs and heather, and the monotony of the view is relieved only by the stacks of peat piled up on the hills and the black cuttings from which the peat is taken.

The soil is not fertile, and the climate is utterly against any possibility of cultivation. As already stated it is very warm owing to the Gulf stream, and for the same reason it is equable, the mean temperature being 44.6° , and the variations in winter and summer being only comparatively small.

The annual rainfall is 37.15 inches, and this seems to come down in a perpetual drizzle. The rainfall of Manchester is about 30 inches. It is not difficult then to understand that the crops are very uncertain, and that systematic farming on a large scale is quite out of the question, excepting in a few isolated valleys. The land is let out in crofts, and with the croft is the right to cut so much peat from the hill. Besides his little plot of land the crofter will keep a cow, some sheep, hens, and a pig. The land being so uncertain the men are compelled to take to fishing in addition to their crofts, leaving these in charge of the women. But the women cannot afford to spend too much time on the croft, as knitting is a more certain source of income. The crofts thus do not get quite so much attention as they might, but the crofters are usually so hardworking and industrious that they get as much attention as is profitable. The methods of agriculture are necessarily crude, and rotation of crops is impracticable. Till a few years ago, when the soil became impoverished, fresh soil was taken from the hills and simply laid on the top of the old. This very wasteful process, called "scalping," had to be stopped, and fish manure is coming into use.

The live stock is frequently allowed to deteriorate, the crofter keeping more cattle than he has grazing ground for, and selling his best at the earliest opportunity.

The houses are very unattractive, and consist simply of the "butt" and "benn;" the peat fire is often in the middle of the floor, and there is an extraordinary amount of dirt and untidiness. The walls are of stone, frequently without mortar, and in the older houses the gable ends are made of peat, as the people were not sufficiently good masons to build them of stone. Gable ends always seem to be a difficulty, and it will be remembered by the reader that the highest Swiss chalets, which could

not be made of wood, owing to their distance above the line where trees stop, are built of stone, but have gable ends made of *wood*.

The roof is of thatch, and heather is allowed to grow on it so as to bind it together and prevent the wind taking it off. The new houses, however, are very neat stone buildings, with proper gable ends and roofs of corrugated iron.

Shetlanders never seem to be tired of spending money in trying to change their peat bogs into cultivated land, and though the experience of a century is against it, some of them still continue in their efforts, the only recompense they desire being to see a little more of their island looking bright and flourishing. The first process is to make a road through the proposed farm, a difficult undertaking, owing partly to the uneven and partly to the soft nature of the ground. Afterwards sand is sprinkled all over to kill the rough grass or "burra," then oats and grass can be sown.

A process more successful from a financial point of view used to be to let the ground out in crofts, and when the crofters had improved the soil to turn them out and make a sheep run. It is satisfactory to learn that this process is no longer profitable, owing to the fall in prices of sheep caused by importation from America.

We have spoken of the absence of trees. It does not seem that trees were always absent, for in digging out the peat, roots of trees are not infrequently discovered, though I never heard of any large roots being found. Tradition has it that trees used to grow on the island, and when they began to get scarce the "Jarl" Einar, discovered that peat could be used as fuel. He is always called "Torf" in remembrance of this.

Had trees ever been plentiful whilst the islands were inhabited, we should expect some mention of them as place-names, but in Dr. Jacobsen's book I can only find two clear instances: they contain the word "Lund," which Dr. Jacobsen thinks is probably the Norse "Lund-r," grove.

Wood and coal have alike to be imported, and of course they cannot be used by the crofters on account of the expense. Peat is therefore burned: this is cut out of the bog by the men in May with a peculiarly shaped spade, and it is done so quickly that in three days one man can cut sufficient peat to last a whole year. The separate pieces are then staked by the women in such a way that they may dry: and during September the peat is carried to the house, also by the women, in baskets called "cazies," slung over their backs by a band across the chest. This is cruelly hard work, 10 or 12 cart loads being required for each family—for peat burns quickly—and sometimes it has to be carried a distance of more than a mile. Formerly people could cut peat anywhere on the hills, and some took to carrying it to Lerwick and Scalloway to sell, but this threatened to use up the peat too quickly, and now each crofter has a certain area of the hill allotted to him, from which alone he may take peat. The "cazies" are made by the women from rushes, which they ask permission to cut. They also make their own shoes, called "rivlins." These "rivlins" consist simply of a piece of cowskin with the hair left on, sewn into the shape of a slipper.

But the Shetland women are known *par excellence* for their knitting. They knit almost night and day, and do it quite mechanically. Even

when carrying home the peat they knit. As, however, they are often paid on the truck system, they do not derive much profit from their labour. The wool is not clipped as in England, but is pulled from the sheep's back ("rooin'.") It is said not to be a painful process as the wool is practically shed before "rooin'," and it is further said to insure the fineness of the next year's crop. Whenever the animal is evidently in pain it is of course clipped. The women spin the wool themselves, and often in peeping into a cottage one sees the wheel going; they also dye their goods themselves. The trade in woollen goods has only recently arisen; 50 years ago the exports were practically nil. By dint of practice the Shetland knitters have learned to produce some marvellously fine shawls; I saw one priced £30. There is also some weaving; but the practice of having the wool machine-spun is increasing, and it is considered that this will endanger the woollen trade.

One naturally associates Shetland with wool and ponies. These tiny creatures, not much bigger than a good-sized dog, are very hardy and extremely sagacious. They are left on the hills to feed, and, if you have occasion to use a pony, you catch one and make him carry you to your destination, always assuming, of course, that you *can* catch him, and remain on his back. A Shetland pony will never lose his way, and can always pick a path across a bog, even on the darkest nights. They are neither housed nor shod, because they are not, as a rule, used to do work; they are left out on the hills all the year round, and in winter it has happened that one could brush the hoar frost off their backs in the mornings. When the ground is covered with snow they clear away the snow with their feet to get at the grass, and if this runs short they will even go to the beach and eat seaweed, going at the turn of the tide in order to get it more easily. None of the peasants to whom I spoke had heard of a pony dying from exposure, but it seems highly probable that such an intensely hard life should stunt the growth, and that the smallness which we admire in Shetland ponies is really only the result of long living on the verge of starvation. A pony can be bought for £2 or £3: but if it is full grown it will cost £7 or £8.

FISHING.

In addition to their crofts, the men are fishermen, and splendid fishermen, too. They will put out in little boats which seem totally unfit for the open sea, and remain out sometimes as long as three days. From October to March they fish for haddocks. This has not long been started, and employs them during months when they used perforce to be idle: from March to June they fish for cod and ling (line fishing), and from June on for herrings (nets). The herring fishing is by far the most important, and whilst it lasts any one walking inland from Lerwick is asked by many anxious inquirers, "What news of the herring?" for a bad herring season means much distress during winter. This herring, or deep sea fishing, is much bound up with the Shetlander's life, and is called the Haaf. Owing to the small size of the boats, the violence of the gales, and the reluctance of the fishermen to turn back once their nets are set, it is the time of many disasters. The successful termination of the "Haaf" is celebrated with much festivity.

Coal fish (saithe) are caught from the rocks by lines. This used to be much more frequently caught than it is now, and the importance of the saithe in the life of the Shetlander is proven by the fact that the fish is called by different names according to the size to which it has grown.

There are other fish—saithe, halibut, etc.—but no whales. Formerly some Aberdeen firms had agencies in Lerwick for getting men for their whaling vessels, but this is no longer so, and very few of the Shetlanders, and none of the Shetland boats, go after whales.

Much of the fish is cured, some is sent away fresh, and some used on the spot.

It would be difficult to find a more industrious race than the Shetlanders. The men do the heavy work on the croft, such as building, etc.; they cut the peat and go fishing, and in the intervals make and mend their nets and do general work on the croft. The women work on the croft, always doing the reaping and looking after the cows, which they take to graze on the hill, and sometimes even doing the ploughing; they knit perpetually; they carry peat and unload the boats—for which dock labourers' work they receive 2½d. per hour! But with all their work and all their industry they have great difficulty in making both ends meet. The crops can *never* be relied upon, and the fishing is always uncertain. If one or the other fail, they have a hard winter; and if, as sometimes happens, both fail, then they are reduced to very great straits. They are too poor to leave the island, and they are obliged to remain on their crofts, consequently the landlords used to feel justified in keeping the rents high. A few years ago (1886), when the crops utterly failed, and the high rents were pressed for by the landlords, public opinion was aroused, and the Crofter's Commission appointed, which, in many cases, lowered the rents 30 to 40 per cent (1889). The fixity of tenure and the low rents thus obtained have so satisfied the people that subsequent visits of the Crofters' and Deer Forest Commissions have excited but little interest. The people are happy and contented—contented to a degree which is very refreshing to any one accustomed to the English working classes. I heard no one complaining; in fact the women seemed rather to pity their Southern sisters for having so little to do. One of them told me she would be bound none of them could carry peats. This cheerful disposition, combined with the keen struggle for existence, has made them very bright and intelligent, and the visitor is constantly agreeably surprised in talking to the natives. The younger men who can, often leave the island, and many of them have risen to good positions. Owing to this emigration the population fell from 29,715 in 1881 to 28,711 in 1891. In 1861 it was 31,670.

There is a strange mysticism attached to the North, and the Shetlanders are very superstitious and firmly believe in the existence of "trows" or spirits, which demonstrate their existence by making noises and disturbing people, and "nugels"—water sprites—which appear to be messengers of the Evil One. It is difficult for a stranger to learn much about these beings, as the people have a great dislike to talking about them, and I could get but very few to give me their experiences with them. A man of about thirty, whose interesting and intelligent conversation had very much pleased me, surprised me very much by hastily changing the subject when I tried to get him to speak about

"trowies," though he denied any positive belief in them, as he had been out as late as ten o'clock without seeing either trow or nugel! Another one justified his belief in them by saying that prayer involves the idea of an Unseen Presence round us, and, if so, why not these "trows?" They are also firm believers in luck; the old women practise cup-reading, and they are apt to find some interpretation to put on everything one says or does, particularly when one begins to address them. There exists, too, the same idea that the milk of the cow can be destroyed by an ill-wisher, as one finds in Carliganshire. It is supposed to be very unlucky to have fire on board a boat, and during the herring fishing—when the men stay out two or three nights—they never have any fire, and consequently no warm food; they live simply on meal and water. It is also unlucky to call things by their proper names whilst on the water: special "lucky" names have to be used. I was told by an Isle of Man sailor that this is also the case with the Manx fishermen. The words used in Shetland belong to the old Norse language. The origin of the custom does not seem to be clearly ascertained, but it is possible, as Dr. Jacobsen points out, that it arose through dread of the spirits of the sea; the men had to be careful what they were saying, and used words denoting some characteristic of the thing rather than the proper name. Dr. Jacobsen also suggests that the custom must have been deeply rooted in pagan times, as the church and minister had special names. The water spirits would naturally dislike hearing any mention of ministers. To this day the Isle of Man fishermen when out fishing never speak of a minister by this name, but have a special name only used on the sea. The similarity between the Isle of Man fishing superstitions and those of Shetland is, no doubt, due to the fact that Norsemen settled in both places.* These names are very figurative: Thus, the cat is called *foodin*, which means light-footed animal, or *voaler*, the wailer, from its wailing cry (Jacobsen).

Notwithstanding the enormous danger to which the fishermen are exposed, they are unwilling to insure their lives because this would bring bad luck, and may even cause deaths which otherwise would not have happened. An insurance agent who canvassed the fishermen told me he had very great difficulty in combating this superstition, which, by the way, must be either a very modern one, or an old one with a new application. I learn that the Manx fishermen have a similar aversion to insurance.

FESTIVITIES.

The Shetland list of festivities is rather a long one, but here again they are distinctly Norse. A brief mention of the Christmas festivities as carried out at Lerwick must suffice. On January 1st and 5th the young people mask and dress up (being called "guizers"), and go to any houses which may be open to them, dance, and have light refreshments, but do not unmask till late at night, even if at all. The next festive day is January 29th, and is called "Uphellya." This is the day *par excellence*. In the evening there is a torchlight procession, headed

* When they fled from Norway in 870 some of the Norsemen went to Iceland, some to the west coast of Scotland, others to the Isle of Man, and others to the north of England. In all these places they have left some traces behind them, thus a few of the words used in the Shetland dialect also occur in the Lancashire dialect.

by a Norse galley, wherein sit six fiddlers playing Shetland reels. When the galley reaches the market-place the people stand round and sing and throw in their torches till it burns. Shetland reels are in great demand at country weddings, and the dance is quite different from that in Scotland.

The people are very sober, and one rarely sees a drunken man. There is no brewery in the islands, and one which was started some time back failed. A beverage used to be brewed from here in the old days of home-brewing, but I believe this is no longer done. There are very few public-houses, though the practice of "shebeening" is not altogether unknown.

The tourist will find Baddeley's an excellent guide, and readers seeking further information can find it in Hibbert's "Shetland Islands"; Poyen's "Reminiscences," a most delightful little book; Jacobsen's "Dialect and Place Names," all published by Manson's of Lerwick.

In conclusion we may give the meanings of a few of the Shetland place-names, taken from Jacobsen (probably the most reliable authority).

Shetland (Hjaltland), uncertain.

Uyea, the island.

Bressay, Unst, Yell, Fetlar, uncertain.

Burra, broch island.

Whalsay, whale island.

Lerwick, clay creek.

Scallaway, Skali = hut, waa = voe, *i.e.*, the voe of the huts occupied by the men assembled for the law-ting held close by.

Sumburg (sunn-borg), south broch.

North mavin (corruption of Northmavid), north of the narrow isthmus.

NEW BOOK.

"HINTS TO TEACHERS AND STUDENTS ON THE CHOICE OF GEOGRAPHICAL BOOKS FOR REFERENCE AND READING, WITH CLASSIFIED LISTS."

Prepared at the request of the Geographical Association by H. R. MILL, D.Sc., F.R.G.S., &c. London: Longmans, Green and Co. 142 pp. No index. Price 3s. 6d.

This small manual, prepared at the request of the teachers, is divided into eighteen chapters. A short introduction is given to each chapter, the bibliography following. The book is clearly printed and the contents will have a certain usefulness. Perhaps no two competent persons writing out a list of books for the purpose of this handbook would agree in their choice. But there are some books of great importance we should have expected to see mentioned, and books and atlases are named which are not worthy of the place they occupy. Perhaps the natural omission of Commercial Geography need not be wondered at, but until "Applied Geography," as Dr. Keltie calls this part of geographical knowledge, is more fully insisted and taught, there can only be a lame conclusion to the labours of geographers. We notice, also, that whilst Dr. Mil refers to some of the papers which have appeared in this Journal, and whilst he quotes under "Books of General Geographical Reference" the *Geographical Journal* and the *Scottish Geographical Magazine*, he finds no place for the *Journal of the Manchester Geographical Society*. Notwithstanding this, the book will be helpful to those who wish to make themselves acquainted with the wealth of knowledge ready to their hands.

THE COUNTRY OF CASHMERE.

the RIGHT HONOURABLE SIR RICHARD TEMPLE, BART., P.C., G.C.S.I.,
K.C.S.I., C.I.E., F.R.S.

[Addressed to the Society, in the Mayor's Parlour, Wednesday, December 15th, 1897,
at three o'clock, p.m.]

SIR RICHARD TEMPLE (who brought with him a big portfolio of water-colour drawings of the valley and the mountains which encompass it) gave his address, which, he explained to begin with, was to be of a purely geographical character, in the strict sense of the word. Cashmere was a place which might be regarded from many aspects. He might discourse to them on its landscapes, the fairest to be seen on this earth, upon its antiquities, its hoary ruins—the remains of several nationalities; he might speak of the romantic history of the country, of the people, of the products of nature and of art, of products amongst the most beautiful ever worked by human fingers. But that was not the task he had set before himself. Nor would he speak of glacier denudations and volcanic action, of the sport to be enjoyed, of the fierce black bears of the country, of the wild sheep, or of that wonderful animal the ibex, whose home was in these snow-clad hills. On all these points he would be glad to speak to them another day. Geography was fundamental, and had to be studied as initiatory.

Sir Richard, after this introduction, proceeded to deal with the geography of Cashmere. It was a land, he said, in the midst of the North-western Himalaya, a name which indicated the abode of snow. The Himalaya was a mountain zone extending from the north-west to the south-east, 2,500 miles long and 400 to 500 miles in average breadth. It constituted the greatest mountain zone in the world. The central point of the zone was the Mansarawar Lake. Towards India the mountains were at their lowest, though they were high enough there. It was towards Central Asia that they were highest and most inaccessible. The mountains around the lake were all snow-clad, and were called Kailas, or Paradise. They were the abode of the gods, the Olympus of the Hindoos.

Sir Richard described the wonderful river systems flowing east and west from this centre of the mountain range, which he declared to be the most important water-parting in the world. On the south-eastern side there were two ranges of the

Himalayas, and on the north-western, the side with which they were concerned, were three, all of them under perpetual snow. The first of the three ranges overlooked the Punjab plains and India, and was called Pir Panjal. The second, overlooking Cashmere, was called Zanskar, and the third, overlooking the Indus, was called Kara Kurum. Cashmere proper lay between the first and second ranges, and the dependencies of Cashmere on the Indus—of greater political importance than the valley itself—lay between the second and third ranges. The ranges Sir Richard spoke of as groups “in echelon,” with intermediate saddles and water-partings. The front range was from 18,000ft. to 20,000ft. above sea-level, the second range from 20,000ft. to 25,000ft., and the third from 26,000ft. to 28,000ft. Sir Richard proceeded to give a topographical survey of the beautiful valley, and described its approaches by Banihai, Pir Panjal, and Baramulla.

An account was further given of the river Jhelum from its source at one end of the Valley of Cashmere to its exit at the other, and of the several lakes which are connected with the Jhelum inside the valley. It was by this river that Alexander defeated an ancient king, with all his elephants, and found entrance to India.

The fountain where the river had its source used to be considered by the great Mogul as the fairest point in his dominions, and the last wish of a Mogul Emperor in a dying state was to see it once again. Vernag, the name of the fountain, was an indication of the old snake worship of the valley. “How is the snake looking this morning?” was a question the Mogul used commonly to put to his native servants.

From the fountain Sir Richard took his audience to Islamabad, the navigable head of the river, and its junction with the tributary Liddar. Henceforward the river became the highway of Cashmere. They entered a boat and wandered luxuriously away on the sluggish water, the sinuosities of which were infinite. They sailed on past the Takht-i-Suleman Hill—meaning “Solomon’s Throne”—till the magic scene burst on their view of the city of Sirinagar, the beauties of which were sung by Tom Moore. How did they pass through Sirinagar? Not on foot or on horseback, but by gondola. It was a city on canals and river and lake, and was properly the Venice of the Himalayas. They went on winding and winding on the Jhelum till they came to the Walar Lake, the finest lake in the Himalayas, on to its exit from the valley at Baramulla, where it received the Sind affluent. Sir Richard had no doubt that the valley was at a former geological period an immense lake, but that volcanic action caused the Jhelum to burst forth and send its waters over the Northern Punjab. At the western extremity of the valley they came to the mountain called Nanga Parbat.

meaning the "naked hill," one of the most picturesque groups in the whole of the Himalayas, and the great boundary fixed by nature to the western part of the Cashmere Valley. Those who have seen it declared that it made their heads ache to watch for all its beauties, so intent was their observation.

Without stopping to describe the tribes, he might mention that the area of the valley was 2,100 square miles and its population 920,000 souls, or more than 420 to the square mile. When he was there he found the people somewhat misgoverned, but now they had come under native rule, tributary to the British, he was happy to think that the people inhabiting this delicious clime had their rights recognised, and lived at least in comfort and respectability.

Some details concerning the Margs, or Alps—a high upland pasture ground—were given by the speaker. It was here the shepherds took their flocks and the herdsmen their cattle to graze in summer days. As soon as the snow melted they came and found many square miles in area looking just like an unbroken bed of tulips, so rich and varied was the floral display. This was the most lovely feature of the mountains. Another feature they had was in the Kharewas, plateaux with beautiful forests and flora.

Sir Richard proceeded to describe the scene as it presents itself from Solomon's Throne. From this vantage ground they saw the whole of the first range of mountains from end to end, and a very wonderful panorama it was. To the right they had the second range, while below they could trace the whole course of the Jhelum, could see the whole of the fertile valley, could mark places famous in Indian story, and could look over the lakes celebrated in Moore's "Lalla Rookh," while far away was the dark blue line of the Walar Lake. With snow all around him, one had an earthly paradise below.

Sir Richard next dealt with the three approaches to Cashmere. What he regarded as the future British road was from Gilgit to Yasin, under the Hindu Kush or Indian Caucasus (as Alexander called it), which was a continuation of the Kara Kurum range, thence by the watershed and pass to Chitral. The position of Chitral was sketched, and an account was given of the approaches from Cashmere first to Yarkand and secondly to the Pamir, with some reference to the political bearings of the approaches.

In conclusion, Sir Richard invited his audience to climb, in imagination, the Pir Panjal mountains. From this they had perhaps the finest view in the world, including more or less all three ranges of the north-west.

EARTHQUAKE OF 12TH JUNE, 1897.

By R. D. OLDHAM, Superintendent, Geological Survey of India.

[Read to the Society.]

ON the afternoon of the 12th June, 1897, at five o'clock, Calcutta was startled by a shock of earthquake such as it had never felt before; many houses were more or less injured, the steeples of two churches broken off, and hundreds of people rendered homeless. Soon, however, it became evident that other places had suffered far more severely than Calcutta. Railway and telegraphic communication was cut off, and it was only as the days wore on and news tardily arrived from the north and from the east that we found ourselves faced with a cataclysm which rivalled the classic earthquake of Lisbon in violence and extent.

No sooner were we aware of the scale of the event we had to deal with than preparations were made for its thorough investigation. The immediate succession of the rainy season on the earthquake rendered it imperative that observation of its effects should be made with all possible promptitude, and every officer of the Geological Survey then in Calcutta was despatched to observe and investigate. At the same time orders had been issued by Government to the local authorities to report fully on the effects of the earthquake. All the telegraphic offices throughout India were instructed to report the time at which it was felt, and similar information was called for from all the station masters on the lines of railway within the area likely to be affected. Circulars have also been widely distributed and communicated to the press, which has readily assisted in the endeavour to collect information.

The replies to these circulars and the reports called for from Government officials are now pouring in at a rate which defies satisfactory analysis, but some of the main facts about the earthquake, which have been already established, may be noticed here.

The area over which the earthquake was felt is enormous. On the east it had been reported as felt from the furthest extreme of Assam, at Mogok, Magwe, and Akyab in Burma; on the south, at Masulipatam in Madras, and Ellichpur in Berar: from Surat, Ahmedabad, Mount Abu, Ajmere, Panipat, and Simla on the west. On the north it was felt at Katmandu; at Gnatong, on the frontier of Sikkim and Thibet, it was severe enough to overthrow some of the barrack chimneys, and it is reported to have been felt at Lhasa. Besides these observations, which are free from doubt, the shock appears to have been just perceptible to a few people, particularly sensitive or specially favourably situated, in Dharmasala, Madras, and Pegu. Omitting these last, there remains the fact that the range of the shock was over 24 degrees of longitude and 16 degrees of latitude, or an

area of over 1,500 miles in length and 1,000 in width, or, say, 1,275,000 square miles in all.

The area over which the shock was destructive is also great; from Darjiling, Monghyr, and Calcutta on the west, to Jorhat on the east, damage and occasional destruction was caused to buildings, but this destructive force reached its maximum in Shillong, Cherrapunji, and Tura. In Shillong, it may be said almost without exaggeration, that not one stone has been left standing on another. All masonry buildings have been levelled to the ground, and this, not by overthrow, but by a shattering of the walls into fragments, on the top of which the roof subsided. The nature of the destruction will be best understood by a reference to Plate XVI,* which gives a view of Government house after the earthquake, drawn from a photograph taken by Mr. F. H. Smith, of the Geological Survey. The other drawing on the same plate shows the influence of construction; the central portion of the hotel was built of stone, and has been shaken to the ground. The two ends, however, which were additions to the original building, and built of a wooden framework filled with reeds plastered with mud, have stood, though severely shaken.

At Shillong it is possible to form some idea of the violence of the shock. In 1882 a scismometer composed of a series of cylinders of various diameters was set up. The largest of these is 12 in. by 9 in. diameter, and the whole series was overthrown to the north-eastwards. According to Omori's formula a cylinder of these dimensions would be overthrown in a direction away from the origin of the shock, as these were, by a velocity of wave particle of 2 feet per second, and if we take the period of vibration as one second, which is about that of the more severe shocks in Japan, this would imply a range of motion of 7·4 inches. In other words, the violence of the shock at Shillong, while it lasted, was at least equal to a backward and forward shake of 7 inches repeated 60 times a minute. If the range of movement was less, the rate of shaking must have been greater; if the movement was slower, the range of motion must have been greater in the same proportion.

That few structures, except those most strongly braced together or possessed of a very great flexibility, could stand this is not difficult to understand, and the violence of the to and fro movement will perhaps be best appreciated from the fact that the very boundary pillars have been shaken to pieces and heaps of broken road metal by the roadside were scattered out in layers of a few inches deep.

Earth-fissures and sand-craters are reported throughout the alluvial plains from Purneah on the west, to Jorhat on the east. They are, as is well known, only superficial and secondary results of the earthquake wave, but afford, among other information, instances of the extraordinary manner in which observation may be influenced by imagination. Numerous accounts speak of a strong sulphurous smell of smoke issuing from the vents, and of hot, even boiling hot, water being poured forth. More temperate accounts show that the sulphurous smell was that of decaying vegetable matter, that the smoke was dust, and that the heat of the water was no greater than was to

be expected in the middle of June. Closely allied in origin to the sand vents was the filling up of all the drainage channels, tanks, and wells over large areas. That this was not due merely to an outpouring of sand, but to an actual forcing up of the bottoms of the hollows is shown by the effect on bridges, whose piers have been forced bodily upwards, as is shown in Plate XVII.,* reproduced from one of the admirable series of photographs taken by Messrs. Kapp and Co., of Calcutta. The other figure on the same plate, reproduced from one of the same series of photographs, shows how the rails have been affected by the movement of the surface alluvium consequent on the shock.

The rate of transmission of the wave was very high, in fact it has been stated in newspapers, and frequently spoken of, as having been felt simultaneously throughout Northern and Eastern India. Such was not the case, however, though the time the wave took to travel from its origin to the furthest point at which it was sensible to unaided observation does not appear to have been more than eight minutes. The very large number of time observations, of every degree of accuracy, which have been communicated, have not yet been discussed, and no definite statement can be made, but a few selected at random as apparently good give an average rate of transmission of about 10,000 feet per second or over 112 miles per minute. This result indicates the order of magnitude of the figures we have to deal with, though it cannot be accepted as final, or more than very approximate. The prevalent idea of the simultaneousness of the shock is disproved by a quaint report by the telegraph master at Chupra, who relates that he was working Durbhunga when there was suddenly a stoppage due to the earthquake at Durbhunga, and the signaller leaving the instrument there, and immediately afterwards the earthquake was felt by him. According to the daily papers a similar incident took place at Dhubri, which was at the time in communication with Goalpara.

Beyond the area over which the earthquake was felt its effects were traced instrumentally at Bombay, where the instruments in the magnetic observatory were affected by a disturbance commencing between four and five minutes past four, local time, or 16 hours 34 minutes Madras time, that is, six minutes later than the shock was felt at Calcutta, and about nine minutes after the probable time at which the shock started on its way from the place of origin, somewhere below the Garo or Khasia hills.

The effects of the shock are said to have been traced at Grenoble; and at Edinburgh a letter from Mr. Heath, Assistant Astronomer, to *Nature*, gives the time at which the tremors were first felt as June 11th, 23 hours 18 minutes G. M. T.; they lasted about 10 minutes and then ceased, and violent oscillation again set in at 0 hour 32 minutes G. M. T. of 12th June, and continued up to 1 hour 12 minutes. They were equivalent to a tilting of the ground through 20 seconds of arc. Greenwich mean time June 11th, 23 hours 18 minutes (astronomical) corresponds to Madras time 16 hours

* These illustrations of the destructive effects of the earthquake are not reproduced, but may be seen in the Library.

39 minutes of 12th June (civil); 0 hours 32 minutes G. M. T. of 12th June corresponds to Madras time 17 hours 53 minutes of 12th June. If both these sets of tremors were due to the same earthquake the first must have travelled the distance from the origin to Edinburgh, starting at about 16 hours 25 minutes Madras time, in 14 minutes, the other in 1 hour 28 minutes.

These few notes form no adequate account of the earthquake; this is in preparation, but the collection and discussion of the information will take some time. Meanwhile what has been written will serve to show the order of magnitude of the cataclysm of 12th June, 1897, an earthquake unsurpassed by any since the great Lisbon earthquake of 1st November, 1755, and rivalling this in magnitude of the area over which it was felt, surpassing it indeed if we exclude the doubtful records of the earlier shock.

NEW BOOKS.

“BIMETALLISM.” A Summary and Examination of the Arguments for and against a Bimetallic system of Currency. By MAJOR LEONARD DARWIN. London: John Murray, 1897. 338 pp., diagram and three tables.

THIS will not be a popular book, but it is an honest attempt by a bimetallist to look at both sides of the question. It is doubtful how far this treatise will be convincing to the opponents of Bimetalism, and the usual difficulty is experienced of a Bimetallist stating the other side. The volume will, however, repay careful study. It is not to be read in a hurry but with much thought. Major Darwin has a right to expect that the care and thought he has expended upon this treatise should have a fair and careful perusal.

“LANCASHIRE POETS AND OTHER LITERARY SKETCHES.” By THOMAS COSTLEY, F.R.S.A.I. Manchester: Abel Heywood and Son, 1897, 336 pp. and index.

THIS volume is a collection of the notes used by Mr. Costley in a series of lectures in Salford, the proceeds of which were given to the Salford Hospital. They are full of interest, and have much topographical as well as other interest. The chapter on “The Songs and Singers of Ireland” is most interesting, being placed before us by a successful son of the Green Isle.

PROCEEDINGS OF THE SOCIETY.

JANUARY 1ST TO SEPTEMBER 30TH, 1897.

The 417th Meeting of the Society was held in the Coal Exchange on Saturday, January 2nd, 1897, at 5-30 p.m.

The Victorians again invited the children of the members under 12 years of age to a reception, and a very large number of the children were present.

Lady LEECH presided, and was assisted by the Victorians. Miss Carie Moore, whose kind assistance was invaluable; Miss Williamson, Master Richardson, with his violin; Mr. G. A. Irlam, who again contributed to the enjoyment of the party by his clever tricks of legerdemain; by four little girl friends of Mr. Dentith's, who came from Saddleworth to give pleasure to the children, and who performed a very pretty and clever dance; by Miss Bull, Mr. F. Rigg at the piano, and Miss Wilde.

The competitions answering the questions in the children's page of Geography were submitted to a jury, and a verdict having been given, the competitors received their prizes at the hands of Lady Leech. Dolls to Miss S. A. Irlam and Miss Reed, and engines to Master R. C. Bellamy and Master Hampden Irlam. Lady Leech accompanied the gifts with a few pleasant words.

Mr. Councillor Sherratt made the children happy with a gift of sweet things, and a lady had very kindly sent a great Christmas cake.

Two or three lantern shows were given, which were instructive (geographically) and amusing.

Children's dances were indulged in, and each child went away with a quaint souvenir of the evening's pleasure. For these small people the night closed early, although a good many protested they had not had enough.

The Victorians were fairly tired, but the children were delighted, one small gentleman enquiring as he was carried down stairs if the next meeting was to be on the following Saturday.

Very hearty thanks were given to all who had so kindly assisted, to the Victorians, and to the Society for the pleasant party.

The 418th Meeting of the Society was held in the Library on Friday, January 15th, 1897, at 7-30 p.m. Mr. Alderman I. BOWES in the chair.

The Minutes of Meetings 416, December 22nd, and 417, January 2nd, were read and approved. The election of the following members was announced:—

LIFE: Mr. J. R. Newby and Miss Gertrude B. Dosey.

ORDINARY: Mr. Thomas Sawyer, Mr. Aubrey Franks, Rev. Dr. B. Solomon, Mrs. Mary Zimmern, Miss G. A. Wallwork, Mademoiselle Blanchoud, Mr. James Lanyon, J.P., Mr. Mark L. Sykes, Mr. Christian Ege, Mr. Philip A. Herford, Mr. W. H. Shirley, Mr. Charles Nordlinger, Mr. S. L. Coulthurst, Mrs. Grafton, Mr. Paul Jaffé, Miss Millington, Mr. G. S. Cook, Mr. Charles Archibald Scott, Mr. A. England, Mr. R. T. Heys, Mr. George Fern, Mr. P. G. Ramsay, Mr. Charles Duckworth, Mr. S. Baerlein, Mr. A. W. Wilson, Dr. F. H. Worswick, Mr. Max Uhde, Mr. Jules Buchmann, Miss M. A. Lancaster, and Miss Woolston.

ASSOCIATE: Mrs. J. H. Lewis.

Letters from Mr. Clement Wragge, Mr. G. E. T. Smithson, Mr. K. W. Hiersemann, and Mr. G. Tutill were read.

MR. CLEMENT WRAGGE'S LETTER.

New York, January 2nd, 1897.

MY DEAR MR. SOWERBUTTS.—I must apologise for not sending the corrected manuscript of this lecture by this mail. We have had a very rough passage—not conducive to literary work. However, I intend to send it from Honolulu.—Wishing you all prosperity for 1897, yours very faithfully,

CLEMENT L. WRAGGE.

E. Sowerbutts, Esq., Manchester Geographical Society,
Manchester.

A large number of presentations were announced.

Mr. THOMAS WEIR, hon. sec. of the Manchester branch of the British Astronomical Society, addressed the Society on "Within the Arctic Circle with the Eclipse Expedition." (See Vol. XIII., p. 81.) The address was illustrated with maps, diagrams, and lantern slides, made from photographs taken by Mr. Weir on the expedition.

Several questions were asked.

Very hearty thanks were tendered to Mr. Weir for his admirable address.

The 419th Meeting was held in the Library on Friday, January 22nd, 1897, at 7-30 p.m. Mr. J. D. WILDE in the chair.

The Minutes of Meeting 418, held on January 15th, were read and approved.

Presentations to the Library were announced. The election of the following ordinary members was announced:—Mr. Councillor John Clarke, Mr. Thomas Shorrocks, Mr. F. Mertens, Mr. W. E. Hoyle, M.A., Mr. Arthur S. Phythian, Mr. A. Guichard, Mr. J. W. Price, Mr. Henry Thorpe, and Mr. T. J. Gill.

Correspondence from the following was submitted to the meeting:—Mr. J. H. Pownall, Sir W. H. Bailey, Kt., Mr. T. R. Newby, Rev. S. A. Steinthal (Cannes), and Mr. Thomas Weir.

Mr. F. S. OPPENHEIM, B.A., read the "Story of Podgers in Norway by his Curator." The paper was illustrated with maps and many lantern views. The paper was a description of parts of Southern Norway not in the usual

tourist's track. The descriptions of the scenery, rivers, mountains, glaciers, of the upland farm life of the Norwegian farmer was most interesting, and the adventures of "Podgers and his Curator" were related with a considerable amount of humour.

Mr. J. R. NEWBY read an account of his recent visit to Iceland (see Vol. XII., page 174) to inspect the scenes of the terrible earthquake in 1896. The address was illustrated with a large number of photographs of the disturbed districts, taken by Mr. Newby in 1896.

The SECRETARY read an address by Mr. J. P. Thomson, F.R.S.G.S., President of the Queensland Branch of the Royal Geographical Society of Australia, on Sir William Macgregor's recent interesting and geographically valuable journey through New Guinea.

Very hearty thanks were tendered to Mr. Oppenheim, Mr. Newby, and Mr. Thomson for their valuable addresses.

The 420th Meeting of the Society was held in the Memorial Hall, Albert Square, on Monday, January 25th, at 7-30 p.m. Mr. Alderman I. Bowes in the chair.

Mr. E. W. MELLOR, J.P., F.R.G.S., addressed the Society on "The Cruise of the *Dolfyn* in Dutch Waters." (See Vol. XIII., p. 1.) The address was illustrated with Mr. Mellor's fine photographic slides made from photographs taken by him in the course of several weeks' voyaging in the yacht. They were shown on the large screen by Mr. Mellor's powerful lantern, and were very greatly enjoyed, and a very hearty vote of thanks was passed to Mr. Mellor and to his assistant for their great services.

The 421st Meeting of the Society was held in the Library on Tuesday, February 9th, 1897, at 7-30 p.m. Mr. J. D. WILDE in the chair.

The Minutes of Meetings held on January 22nd (419) and 25th (420) were read and approved.

The election of Mr. William Harper as an associate member was announced.

A number of maps and books presented to the Library was announced, and exhibited to the members.

The following correspondence was read:—Rev. F. C. Smith, B.A., Mr. J. Christy, Mr. C. Dyke, Mr. F. Zimmern, the Lord Mayor of Manchester, Mr. C. Guichard, and others.

Mr. FRANK CURZON, F.R.H.S., the Secretary of the Yorkshire Union of Mechanics' Institutions, addressed the Society on "Dear Old Devon," illustrating his many references to the physical geography by rapid sketch maps on the black-board, and referring in his admirable address to the scenery of this garden of England, and to the illustrious men who have sprung from Devon—The Coleridges, Sir Walter Raleigh, Sir Francis Drake, the great warriors Albemarle and Marlborough, Presidents of the Royal Academy Reynolds and Eastlake, to Haydon, Northcote, Prout, Traies, Jewell.

Hooker, the Giffords, Sir T. Bodley, Sir John Bowring, Sir Wm. Follett, Charles Kingsley, and others, in each charming notice giving a rapid reproduction of the likeness on the black-board.

Thanks were tendered to Mr. Curzon for his very interesting address.

The 422nd Meeting was held in the Library on Wednesday, February 17th, 1897, at 7-30 p.m. In the chair, the Rev. S. A. STEINTHAL.

The minutes of Meeting held on February 9th (421) were read and approved. The following members had been elected:—

LIFE: Mr. Charles Ermen.

ORDINARY: Mr. G. C. Mandleberg, J.P., Mr. G. J. Blake, Mr. J. H. Clayton, Mr. Herbert Briggs, Mr. Henry Morley, Mr. H. J. Albrow, and Mr. J. H. Enion.

Letters were read from Mr. J. Cash, Señor Lima (Buenos Ayres), and Miss Curzon.

Mr. Alderman I. Bowes addressed the Society on "The River Danube, from its Sources to the Sea" (Vol. XIII., p. 107), dealing more particularly in his address with the engineering work in the river at the Iron Gates below Orsova. The address was illustrated by diagrams and sections of the work, and with a large number of lantern slides lent by Dr. Williamson and other members.

The SECRETARY read an address on the History of Hungary, and on the great National Exhibition to be held at Budapest to celebrate the 1,000th year of the history of Hungary. The address was illustrated with a very fine large map of Hungary, especially obtained for this evening's address, and with lantern views.

Both addresses were received with great attention, and they aroused much interest, and many questions were asked, and very hearty thanks were given to Alderman Bowes and the Secretary for their addresses.

The 423rd and 424th Meetings of the Society were held at the Free Trade Hall, and in the Assembly Room, on Wednesday, February 24th, 1897, at 7-30 p.m. The chair was taken by the Rev. S. A. STEINTHAL, in the large hall, and on the platform were a large number of the members of the Council. Amongst them were Dr. A. W. Ward, Sir F. F. Adam, Sir Joseph Leigh, Sir Bosdin and Lady Leech, Professor Boyd Dawkins, Professor Core, Professor Dixon, Mr. B. Armitage (Chomlea), the Chevalier Froehlich, Mr. T. R. Wilkinson, Mr. J. P. Thomasson, Mr. Harry Nuttall, Mr. R. Neill, junr., Mr. Rupert Mason, Mr. S. H. Brookes, Mr. S. Oppenheim, the Mayor of Heywood, Mr. S. L. Keymer, Mr. Alderman I. Bowes, Mr. F. Zimmern, Mr. J. D. Wilde, Mr. J. Howard Reed, and others.

Every seat in the large hall and the assembly room was occupied, and, for the first time, every seat was numbered and reserved. It will be interesting to have a copy of the admission ticket, which was especially designed for the Society.

Ticket designed by Mr. W. B. HANDFORD for the Nansen Meeting at the Free Trade Hall.



The arrangements were undertaken by the "Victorians," wearing their badges, assisted by a number of Messrs. Forsyth's assistants. Cloak-rooms were provided for every part of the audience, and bonnets were not worn.

Mr. J. Hindle presided at the organ, and played the Norwegian national anthem just before Dr. Nansen came on the platform. The reading-desk was covered with Norwegian national flags given to the Society by one of the members.

The Central Hall Mission kindly allowed the Society to use their great lantern-sheet, and Mr. E. W. Mellor, J.P., exhibited slides in the large hall most brilliantly with the electric light.

Dr. Nansen's host, Mr. Henry Simon, had one of the boxes, and Mrs. Nansen sat with Mr. and Mrs. Simon there.

The scene when Dr. Nansen appeared on the platform was very brilliant, the whole of the audience rose and cheered most persistently; the scene will not be soon forgotten by those present.

The CHAIRMAN made a happy speech in introducing the lecturer. It may or may not be the case that in future geographers will always write the names of Nansen and Columbus together, but the audience cheered Mr. Steinthal when he said that no parallel for Nansen's achievement can be found in geographical history till we go back to the man who conceived the idea that by sailing westward one could reach the east. He was also happy in including Mrs. Nansen in the welcome given to her distinguished husband, as one who had "the courage to wait." He spoke of the two as hero and heroine.

Dr. NANSEN then for an hour and three-quarters held the great audience spellbound whilst he related the experiences of his companions and of himself in his Arctic journey. (See Vol. XIII., p. 47.)

At the close of Dr. Nansen's address he was conducted to the Meeting in the Assembly Room.

In the meantime Mr. J. D. Wilde had conducted Mrs. Nansen from Mr. Simon's box on to the platform, and then Principal Ward presented her with several volumes, bound in morocco, containing the "transactions" of the Manchester Geographical Society, and also Dr. Nansen's certificate of honorary membership of the Society, to which the Council had previously elected him. Dr. Ward described Dr. Nansen not only as a great discoverer and man of science, but a very distinguished man of letters.

A vote of thanks to Dr. Nansen was awarded, on the motion of Sir FRANK FORBES ADAM, seconded by Sir JOSEPH LEIGH.

The Meeting in the Assembly Room, where all seats were also numbered and reserved, and of which the "Victorians" had charge, was held at 8-30 p.m., when the chair was taken by Mr. B. ARMITAGE (Chomlea).

Mr. G. H. WARREN, one of the "Victorian" lecturers, described the slides as they were brought from the large hall. The lantern was manipulated by the Central Mission demonstrator, and the slides were shown by the lime-light on a sheet 25 feet square; they were well exhibited. When Mr. Warren's explanations had gone on for some time, Dr. Nansen appeared on the platform and received a very hearty welcome; he stayed for some time and charmed the second meeting with his address. On Dr. Nansen's departure the showing of the slides was resumed.

At the close, very hearty thanks were given to Dr. Nansen, the Chairman, and Mr. Warren for their services.

Dr. Nansen and Mrs. Nansen were received at the Exchange Station by the Rev. S. A. Steinthal, Chairman of the Council, Mr. S. Oppenheim, Hon. Treasurer, and Mr. and Mrs. Simon (their host and hostess).

The *Manchester Guardian* described the reception as follows:—

DR. NANSEN IN MANCHESTER.

DR. NANSEN received a hearty welcome from the people of Manchester yesterday. With Mrs. Nansen, he arrived at the Exchange Station from Middlesbrough at half-past two in the afternoon, and was there met by the Rev. S. A. Steinthal, and by his host, Mr. Henry Simon, of Didsbury, and other members of the Manchester Geographical Society. From the station Dr. Nansen was driven in an open carriage to the Royal Exchange. The streets were thronged, and there was much cheering. At the Exchange Dr. Nansen was received by the Chairman of the Company (Mr. Duncan Matheson) and other directors in the rooms of the Master of the Exchange, Mr. J. G. C. Parsons. High 'Change was then just over, but the greater number of the members had remained in order to welcome the explorer. The floor of the great hall was, in fact, crowded, and as the small procession of Dr. and Mrs. Nansen, with their friends and a few of the directors, made its way towards the ascent to the northern balcony the scene was remarkable. The Chairman of the Company afterwards said that, in a long experience, he had seen nothing like it before. Dr. Nansen stood for a minute in the front of the balcony, facing the applause of the thousands of business men below, and then, turning to the Chairman, asked if this great reception could not be acknowledged. There is an unwritten law that no speeches are to be made at ceremonies of this kind in the Exchange. But the occasion was peculiar, and the long-established custom was broken through. For the first time—according to the statement of the Chairman—a speech in acknowledgment of a reception was made from the balcony. It was delivered clearly, and Nansen's voice is so good that every word was audible in the furthest corner of the room. He said: "I have to thank you most heartily, and to tell you the pleasure I feel at the great honour I have received from the greatest commercial centre in the world. At first sight it may seem strange that such a welcome should be given a man who has just come from regions where, it must be said, you at least can get very few orders for your wares. But I have reason to know that the people of Manchester take an interest in things other than those that appertain to commerce alone. I therefore feel that there is a double honour in this reception, and that you welcome me because I have tried to do some thing for the common knowledge, the gain, and the honour of humanity. I am sure that Manchester people will always take a great share in helping forward those things that make for greater knowledge for humanity at large. I thank you most heartily for your welcome." The small party then returned to the rooms of the Master of the Exchange, where the Chairman explained to the visitors the capacity of the building, the number of members of the Exchange, and other details of the business life of the city. Afterwards both Dr. and Mrs. Nansen signed the visitors' book. There was much enthusiasm when, a few minutes later, they drove away to Didsbury.

The next morning Dr. and Mrs. Nansen visited Owens College, being received by the Principal, Dr. Ward, and a large number of the professors. There was a great company of students, and after the inspection they drew

Mr. Simon's carriage, amid much enthusiasm and excitement, to the Town Hall. At the Town Hall Dr. and Mrs. Nansen were received by the Right Hon. the Lord Mayor and the Lady Mayoress, and, amid much cheering, they went away to go to Liverpool from the Central Station.

The reception of Dr. Nansen and his wife has been a most extraordinary one throughout the kingdom, but nowhere has it been keener or more hearty than it has been in this city, and in connection with the Manchester Geographical Society.

The 425th Meeting of the Society was held in the Library on Friday, March 12th, 1897. In the chair, the Rev. S. A. STEINTHAL.

A reception of the members was held at 6 o'clock. There was an exhibition of books, maps, curiosities, and journals which have recently been presented to the Society. The Secretary explained the nature and value of the exhibits. Mr. J. D. Wilde arranged a fine musical programme, and he was assisted by Miss Willoughby, Miss Gibbons, Miss Brocklehurst, and Mr. Bellamy.

A vote of condolence was passed with our corresponding member, the Hon. J. V. Brower, of St. Paul's, Minnesota, on the occasion of the destruction by fire of his great collection of native remains of the Ancient American Indians, on the proposition of Mr. C. H. BELLAMY, and seconded by Dr. J. WORSWICK.

Very hearty thanks were given to Mr. Wilde and his friends for their services.

The 426th Meeting of the Society was held in the City Art Gallery, Mosley Street, on Friday, March 19th, 1897, at 7-30 p.m. In the chair, the Rev. S. A. STEINTHAL.

Mr. A. MONTEFIORE BRICE, F.G.S., F.R.G.S., Honorary Secretary to the Jackson-Harmsworth Expedition, addressed the Society on "The Jackson-Harmsworth, Peary, and Andrée Arctic Expeditions." (See Vol. XIII., p. 73.) Mr. Brice, having been out in the "Windward," had taken the opportunity to secure photographs, and he illustrated his address with one hundred fine studies, those referring to the balloon being most interesting in character.

A very hearty vote of thanks was passed to Mr. Brice for his able and interesting address, and, in his response, he replied to some questions.

The 427th Meeting of the Society was held in the Library, on Monday, March 22nd, 1897, at 7-30 p.m. In the chair, Mr. J. D. WILDE.

The Minutes of Meetings held on March 12th (425) and March 19th (426) were read and approved.

A number of presentations were announced, and some of them were exhibited to the members. The election of the following members was announced:—

LIFE: Mr. J. P. Thomasson.

ORDINARY: Mr. Councillor W. T. Bax, Mr. C. Dennis, Mr. Rupert Mason, Mr. John T. Hilton, Mr. Alfred Hughes, Mr. W. H. Newett, Miss M. W. Wallace, and the Rev. W. Vivian.

HONORARY: Mr. Fridtjof Nansen.

Correspondence was read from the following:—Mr. G. E. T. Smithson, the Right Hon. the Earl of Derby, K.G., Mr. Payton, Mr. J. W. Beaumont, Dr. T. G. Crussop, Mr. S. Oppenheim, the Rev. W. C. Porter, Mr. H. E. Sowerbutts, Mr. J. D. Potter, M. Lombard (Anvers), Messrs. Morris, Gregory, and Holmes, Mr. R. E. Dennett (Loango), and Mr. C. B. Tillinghurst (Boston).

Mr. E. J. RUSSELL, B.Sc., addressed the Society on "A Visit to Shetland" (see page 125), illustrating his address with maps and a beautiful set of Aberdeen lantern slides.

Several questions were asked and some discussion ensued on the cost of the excursion, the lodging on the island, and various other matters.

Mr. J. HOWARD REED proposed, Mr. C. H. BELLAMY seconded, and Mr. W. H. WILLIAMSON supported a very hearty vote of thanks to Mr. Russell for his address. Mr. RUSSELL responded.

The 428th Meeting of the Society was held in the Library, on Wednesday, March 31st, 1897, at 7-30 p.m. In the chair, Mr. J. D. WILDE.

The Minutes of Meeting held on March 22nd (427) were read and approved.

The election of Mr. William Eckersley and Dr. J. Orr as ordinary members was announced.

Correspondence was read.

Mr. J. HOWARD REED addressed the Society on "The Elements of Map Projection," illustrating his address with diagrams, models, and lantern slides. The address was a repetition, with lantern slides in addition, of the address given some time before (see Vol XI., p. 232), and was given in response to numerous requests by teachers and others.

A most interesting discussion took place, in which Messrs. J. D. Wilde, J. F. Tristram, Chevalier Froelich, Mr. C. H. Scott, and others took part.

Mr. REED responded to a very hearty vote of thanks, and gave additional explanations.

The 429th Meeting of the Society was held in the Library, on Tuesday, April 6th, 1897, at 7-30 p.m. In the Chair, Mr. HARRY NUTTALL, Vice-Chairman of the Council.

The Minutes of Meeting held on March 31st (428) were read and approved.

Mr. WILLIAM LANCASTER, JR., of the Burnley Literary and Scientific Club, addressed the Society on "The Island of Skye" (see Vol. XIII., p. 101), being short notes of a journey made in the island in pursuit of Alpine climbing. The address was illustrated with Mr. Pilkington's and other maps, and by a complete set (mounted) of the Ordnance Survey maps of the island and a very fine and beautiful set of slides by Abraham, of Keswick, which had been presented to the Society by the Burnley Literary and Scientific Club.

The Very Rev. L. C. CASARTELLI, M.A., Ph.D., Mr. J. Begg Shaw, the Right Rev. Monsignor Gadd, V.G., Mr. J. J. Gleave, and several other members asked questions and discussed the address.

Mr. LANCASTER replied to questions, and responded to a very hearty vote of thanks passed to him for his lucid and interesting lecture.

The 430th Meeting of the Society was held in the Library, on Tuesday, April 13th, 1897, at 7-30 p.m. In the chair, Mr. HARRY NUTTALL, Vice-Chairman of the Council.

The Minutes of Meeting held on April 6th (429) were read and approved.

Mr. J. D. WILDE, one of the honorary secretaries, addressed the Society on "Lyonnesse." The address was illustrated with a large number of lantern slides especially prepared for this address. Mr. Wilde referred to the romantic and poetic associations, the legendary lore, the charms of the scenery, the climate and the vegetation, so differing from the rest of England, and making Cornwall and the Scilly Isles an interesting subject, and one on which some of the members have asked for information.

A long and interesting conversation took place, and the ways of going to the county were discussed, and the costs of travel, whilst many quaint local customs were mentioned.

Mr. I. DREYDEL moved a hearty vote of thanks to Mr. Wilde for his very valuable and picturesque address. Mr. J. HOWARD REED seconded the vote, and it was carried with acclamation. Mr. WILDE responded.

The 431st Meeting of the Society was held in the Library, on Wednesday, April 28th, 1897, at 7-30 p.m. In the chair, the Rev. S. A. STEINTHAL, F.R.G.S.

The Minutes of the previous Meeting (430) were read and approved.

The election of Dr. R. Schütt and Mr. Karl W. Heirseemann as ordinary members was announced.

Correspondence was read from the following:— Mr. E. W. Greg, Sir F. de Winton, K.C.M.G., Rev. S. A. Steintal, Mr. G. E. P. Smithson, Mr. J. McFarlane, Mr. F. W. W. Howell, F.R.G.S., Mr. H. Hort, Mr. T. W. Sowerbutts, Mr. F. Shackleton, Mr. J. H. Enion, Mr. E. W. Greg, Lord Roberts, Mr. H. G. Kittredge, Mr. Joel Wainwright, Mr. B. Armitage (Chomlea), and Mr. J. C. Chorlton.

Mr. C. GERLAND, M.Sc. (Vict.), Ph.D., F.C.S., etc., addressed the Society on a voyage made last year in the ss. "Erling Jarl," of Trondhjem, in which latitude 81 deg. 35 sec. N., longitude 13 deg. 20 sec. E., in the pack-ice above Spitzbergen was reached. Mr. Gerland described the incidents of the voyage, the Polar Pack, a week with the Andrée Expedition, Sir Martin Conway's Camp on the Ice Fjord, and the Eclipse in Lapland, and illustrated the address with a number of lantern slides from his own photographs, and with botanical and natural history specimens collected on the north and west coasts of Spitzbergen.

Conversation and questions ensued, Dr. Gerland replying to the questions and exhibiting further delicate and beautiful specimens.

Mr. J. HOWARD REED moved and Mr. J. D. WILDE seconded a very hearty vote of thanks for the exceedingly interesting and valuable address. The motion was carried. Dr. GERLAND responded.

The 432nd Meeting of the Society was held in the Library, on Wednesday, May 19th, 1897, at 7-30 p.m. In the chair, the Rev. S. A. STEINTHAL.

The Minutes of the previous Meeting (431) were read and approved.

Correspondence was read from Sir W. H. Bailey, Kt., J.P., Dr. J. Scott Keltie, Mr. C. W. Sutton, Mrs. Oram, Mr. G. E. T. Smithson, Alderman I. Bowes, Mr. S. L. Keymer, General Sir F. de Winton, K.C.M.G., Mr. A. Tucker Wardrup, Mr. A. J. Herbertson, Mr. O. Andrewson, J.P., Mr. G. H. Warren, Mr. K. Hiersemann, Dr. G. W. Black, S.M., Sir G. T. Goldie, the Rev. F. Galpin, the Rev. S. A. Steintal, Mr. J. C. Chorlton, Mr. George Thomas (containing notice of gift of books).

The Paris Geographical Society wrote acknowledging the vote of condolence forwarded to them on the sad event of the late fire in Paris.

The announcement of the following elections to membership was made:—

ORDINARY: Dr. Arnold W. W. Lea.

CORRESPONDING: Mr. A. Montefiore Brice, Mr. A. Tucker Wardrup, and the New York Public Library Society.

Mr. G. H. WARREN then addressed the Society on "Recent Attempts to Reach the North Pole." The address was a resumé of a number of Victorian addresses given by Mr. Warren, and was most instructive.

Very hearty thanks to Mr. Warren was proposed by Mr. BELLAMY, seconded by Mr. NUTTALL, and carried. Mr. WARREN responded.

The 433rd Meeting of the Society was held in the Library, on Monday, May 24th, 1897. In the chair, the Rev. S. A. STEINTHAL.

The Minutes of Meeting held on May 19th (432) were read and approved.

Letters were read from Mr. A. Montefiore Brice, Mr. Zimmern, and others.

Mr. A. Tucker Wardrup, the Customs and Harbour Master for the Port of Sandakan, North Borneo, addressed the Society on "North Borneo: The New Ceylon." (See page 165.) His address was illustrated with maps, lantern slides, and native weapons, which had been lent by the Royal North Borneo Company. Mr. Wardrup was accompanied by two Dyaks, now members of the native police, who had come to England to take part in the Queen's Jubilee procession. They exhibited themselves in the room in their native dress and arms, and were so photographed by Mr. Payton. The intelligent interest with which they watched, for the first time in their lives, a lantern exhibition was very striking. The address was very interesting, and was a valuable contribution to the knowledge of Commercial Geography.

Many questions were asked, to which Mr. Wardrup replied.

A very hearty vote of thanks was tendered to Mr. Wardrup, on the motion of Mr. J. D. WILDE, seconded by Mr. J. HOWARD REED.

Mr. WARDRUP responded.

The 434th Meeting of the Society was held in the Museum of Peel Park, on Wednesday, May 26th, 1897, at 3 o'clock.

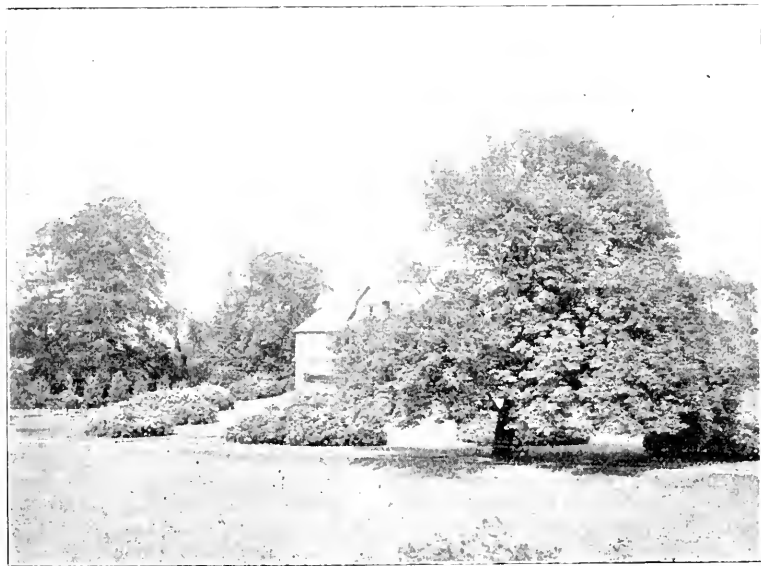
Mr. Ben Mullen, M.A., the curator, received the members and conducted them through the Museum and Picture Gallery.

Mr. MULLEN gave an address on the Museum (see Vol. XIII., p. 115), and then pointed out more particularly the most interesting and valuable exhibits.

Very hearty thanks were tendered to Mr. Mullen for his kind attentions.

The 435th Meeting of the Society was held at Mr. Benjamin Armitage's (Chomlea), on Wednesday, May 26th, 1897, at 6 p.m.

Mr. and Mrs. ARMITAGE invited the Society to visit the Garden of Chomlea to see the fine display of rhododendrons and azaleas, and a large number of members responded to this invitation. They were delighted with the beauty of the gardens and were charmed with the house, which was one of the resting-places of the late John Bright.



VIEW IN THE GARDEN OF CHOMLEA (MR. B. ARMITAGE).

Several photographs were taken, and we were pleased to obtain a good one of Mr. and Mrs. Benjamin Armitage in the centre of a large group at the front of the house. Mr. Stewart was very successful, and copies were placed at the disposal of Mrs. Armitage. At a previous visit two photographs were taken by Mr. H. Sowerbutts, one of part of the garden and one of the house; he has allowed us to use these, and we have pleasure in printing them.

Very hearty thanks were given to Mr. and Mrs. Armitage and to their family, who had done so much to give the members an exceedingly pleasant afternoon.



CHOMLEA, PENDLETON (MR. B. ARMITAGE).

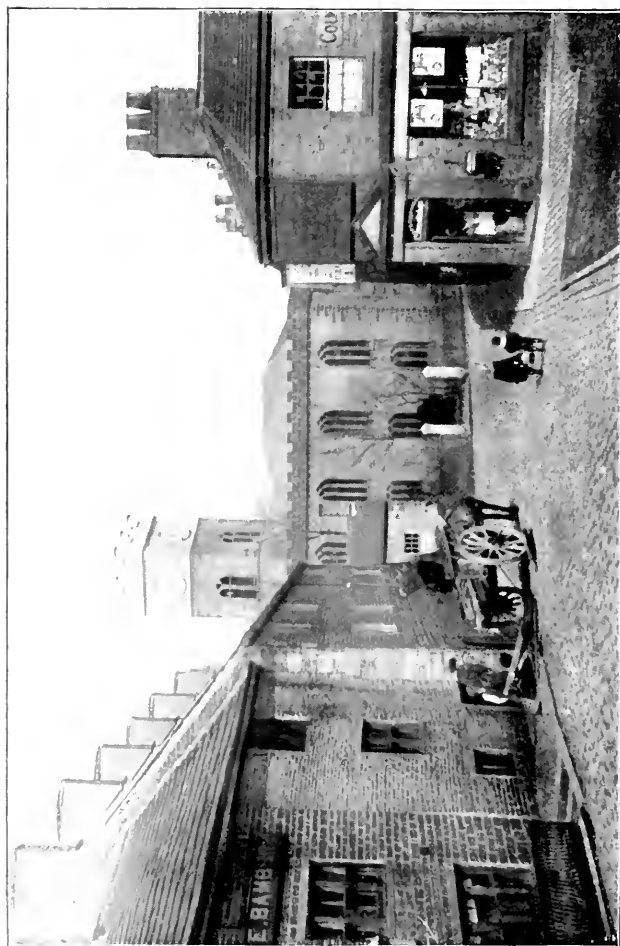
The 436th Meeting of the Society was held at the House of Mr. J. C. Chorlton (Didsbury Priory), on Wednesday, June 2nd, 1897, at 3 p.m.

About thirty members availed themselves of the invitation, and were cordially welcomed by Mr. and Mrs. Chorlton. After tea the visitors were shown round the gardens. The grounds are remarkable for the beauty and variety of the forest trees, which have been arranged and planted with very great taste, and gave a picturesque effect such as one would scarcely expect to find so near Manchester; in fact, the trees are so well grown and grouped that nothing is seen of any other house, and one might, looking at the fine, healthy condition of the trees, believe oneself twenty miles from any large town. The greenhouses were a source of great interest and pleasure. The apricot and peach trees and vines are very fine, and the freshness of colour and beauty of the flowers could scarcely be surpassed.

A vote of thanks to Mr. and Mrs. Chorlton for their kindness and hospitality was moved by Mr. HARRY NUTTALL and seconded by Professor CORE, which was responded to by Mr. CHORLTON.

The members very much appreciated and enjoyed the afternoon.

The 437th Meeting of the Society was held at Sandbach, on Saturday, July 24th, 1897, at 5 p.m.



HAYFIELD.





LEYGATE HEAD MOOR.

A number of members met at the Railway Station, London Road, but it not being found possible to find room in the train, the greater part returned home.

The party who succeeded in getting through had a very kind reception from Mr. Dainton, of the Sandbach Dairy.

The crosses, the Church, the Old Hall (now a public-house), and other buildings were seen, and the work of the Dairy was inspected.

A very pleasant afternoon was spent, and the return journey was made in good time.

The 438th Meeting of the Society was held at the Royal Hotel, Hayfield, on Saturday, August 7th, 1897, at 6 p.m.

Mr. H. T. CROOK, C.E., led a large party of members from Glossop (in carriages) to the Snake Inn, and thence on foot to Hayfield, where dinner was provided.

During the journey the various points of interest in the neighbouring hills and valleys were pointed out by Mr. Crook. The party found the journey somewhat difficult, particularly the elder men.

At the Hotel, after dinner, Mr. FARRON took the chair.

Mr. CROOK then described the road and its position on Kinder, and explained the conditions which had been agreed to for its future use, by the local authorities, the Footpaths Association, the landowners, and those who had shooting rights.

Mr. Councillor CLARK moved, and Mr. C. H. SCOTT, J.P., seconded, a very hearty vote of thanks to Mr. Crook for his guidance and for the great amount of information he had given the members. Mr. CROOK responded.

KINDER SCOUT.

By the kind permission of Mr. Abel Heywood and the Footpaths Association we are enabled to present in this journal the map and a selection of views prepared for the celebration of the opening of the path by that body and the local authorities.

To us who are getting old it seems strange that so stiff a fight should have been necessary for this footpath right, because thirty or forty years ago the Scout was a happy hunting-ground for us who were then young. From Glossop to the Snake, to the Kinder Downfall, from Hayfield to the Snake we wandered at our own sweet will; we never troubled about footpaths, and we were never challenged; but time works wonders, and the report of a meeting of the Association in 1895 is, from this point of view, curious reading, yet it shows how nearly this footpath (like the Roman road over Blackstone Edge) had been lost for the want of somebody to look after it.

KINDER SCOUT FOOTPATHS.

Sir W. H. BAILEY, the Chairman, said at the meeting of the Peak District and Northern Counties' Footpaths Preservation Association, held on October 18th, 1895, in the Methodist Free Church School, Hayfield, they had been called to hear an explanation from Mr. Abel Heywood, Mr. Crook, and others as to the position of the Association in relation to the ancient right of way across and by the crest of Kinder Scout. They had had an interview with the Duke of Devonshire in London. The Duke received them in a very

pleasant way indeed. They told him candidly that the public had rights of way over Kinder Scout, but at the same time they said they would very much prefer a compromise that would be agreeable to the landowners, that would protect everybody's right, and that would not interfere with sportsmen. They even said that if they could deviate the path in any way that would enable sportsmen to enjoy themselves in their own way, a compromise on those lines would be a great deal better than spending money in the law courts. Such a compromise had now been suggested.

MR. ABEL HEYWOOD said that about a year ago they tried to get a through route from Hayfield to Woodlands. One of the strong points of the Association was that if possible they would avoid the friction and ill-feeling that came from lawsuits, and would seek settlements that were amicable. The members of the Association, after some months of laborious search for evidence, satisfied themselves that an ancient right of way did exist over Kinder Scout. Then it was that they went to the Duke of Devonshire, Mr. Marriott, Mr. Sumner, and other landlords. They told these gentlemen what they had done, what evidence they had, and asked them if it would not be well to come to an understanding. The Duke of Devonshire met them most fairly, and made it evident from what he said that he was willing to do what he individually could to further the cause in which they were engaged, and especially to save the annoyance and expense of lawsuits. After seeing the Duke of Devonshire they saw the landlords on either side of the hill. The trouble with them was as to sporting rights. This was the only value of the properties. There was little or no pasture, and there was no meadow or farming land. The landlords said to them, reasonably enough, that in any compromise suggested these facts should be borne in mind. After some little negotiation a new route was suggested—a route which did not deviate very much from the old route except at the Hayfield end. The compromise, he thought, was eminently fair. But on this point he was told there was some little difference of opinion in Hayfield. In a few days they would have to say "Yes" or "No" on the question of the compromise. If they said "No," it would mean that for some time at least the people of Hayfield would get nothing at all. The matter would be thrown back into the position in which it had been for thirty or forty years. There would be again a period of disquietude, and the popular right would get in greater and greater danger, for in the course of another ten years there would scarcely be a witness left who could speak to the ancient use of the footpaths. If the Hayfield people would not submit to this settlement, how would they have to acquire the right now freely offered to them? With their witnesses dead, there was only one way in which they could acquire the right, and that was by paying for it. He hoped the men of Hayfield would not throw away for a sentimental right—he used the expression very respectfully—the substantial thing now offered to them. The solution which was now submitted seemed to be a very excellent one.

MR. H. T. CROOK explained the course of the new footpath. The arrangement, he thought, was one which ought to meet with the concurrence of all reasonable men. The landlords had promised them a path which, while it would not interfere with sport, was as beautiful as the old path to which they had laid claim, and which was not more laborious. It was true that the public would have to abandon claims which had been made to certain paths, but these were paths which were in dispute and over which stone walls had



NAB BROW.



WILLIAMS CLOUGH.

long been thrown. The gradients of the new route were better than those of the old.

This, we are happy to say, has now all been settled; the road has been made passable, and is clearly marked. The map has the path marked in red. It is expected that visitors will not themselves trespass nor allow others to do so. The following description of Kinder by Mr. L. H. Grindon will be read with interest in connection with the new road:—

“The southernmost portion of this huge tract of wilderness is occupied by Kinder Scout, the highest factor of the Peak, the elevation being nearly two thousand feet above the sea; and which, presenting a ‘broad bare back’ or plateau of fully four miles in length from east to west, with a width of more than half as much, is distinguishable at a glance, though often cloud-capped, from all its neighbours. Unfortunately for the rightful claims of massive Kinder, this great length detracts from its majesty, since the majestic, to be appreciated, always demands a certain amount of concentration. In substance, like most other parts of our ‘north-eastern highlands,’ Kinder Scout is millstone-grit, thickly overlaid with mountain-peat, the foothold of wiry scrub, though, here and there presenting bold escarpments. The surface is deeply fissured by rills of drainage-water, and hillocks and depressions are universal. Paths cross it in various directions, but these of course are only for the brave.

“The best route, when it is desired to ascend this noble eminence, is *via* Hayfield, beginning at Bowden Bridge, and going up the valley past Farlands. Once upon the summit, the reward is ample, alike in the magnificent scenery, rich with distant purple shadows, and in the inspiring atmosphere. If in the landscape there is nothing gay and festal, no slight thing is it to stand in the presence-chamber of these antique solitudes, reading the silent history of centuries of winter ravage, so terrible that no wonder the very rocks have thrust up their grey heads to ask the meaning of it. No slight thing is it either at any time to find ourselves beside the very urn of a bounding and musical stream, such as trots along the valley, this one having its birth in ‘Kinder Downfall’—a far-seen shoot of water from the western cliffs, a single silver line of pretty cataract that might have heard of Terni and the Bridal Veil, and so much the more precious because the only one of its kind within the distance, which is from Manchester, say precisely twenty miles. Rain of course is needed, as at Lodore, for the full development.

“The writer of the ‘Guide’ says that another very beautiful and not infrequent spectacle to be witnessed here is when in wet weather, or after a storm, the wind blows strongly from the W. S.-W. ‘Coming from the direction of Hayfield, it sweeps over the Upper Moor and the bare backs of the bleak Blackshaws, and beating against the high flanking walls of rock is concentrated with prodigious power into the angle of the mountain, forcing back the whole volume of the cascade, and carrying it up in most fantastic and beautiful lambent forms, which are driven back again as heavy rain and mist for half a mile across the bog, then perhaps to return to be shivered into spray once more, unless in some momentary lull the torrent rushes down in huge volume.’ ‘Sometimes,’ he adds, ‘in winter, the fall, with the huge walls of rock flanking its sides, becomes one mass of icy stalactites, which as the sun declines present a magnificent spectacle.’ According to Mr. H. B. Biden, in *Notes and Queries*, Feb. 16th, 1878, though other writers think differently, and, as it seems to us, less reasonably, it is to the Downfall that

Kinder Scout owes its name. Kin-(cin)-dwr-sewd, he tells us, in Cymraeg signifies 'High water cataract.'"

From the little pamphlet published on May 29th, 1897, when the footpath was opened, the following notes and descriptions of the pictures are taken:—

THE WORK OF THE ASSOCIATION IN OBTAINING A RECOGNISED FOOTPATH.

"The path from Hayfield to the Woodlands, *via* Williams Clough, Mill Hill, and Ashop Clough, has been secured to the use of the public for all time, and is now dedicated to the public use by the owners of the lands it traverses. These owners are His Grace the Duke of Devonshire, K.G., F. J. Sumner, Esq., J.P., S. H. Wood, Esq., J.P., John Marriott, Esq., and Mrs. Wilks; and it is only just to them to say that they have agreed to this public dedication without acknowledging that the public had the right of way claimed.

"The Peak District and Northern Counties Footpaths Society was formed in August, 1894. Its Committee, after investigating as fully as they were able all the circumstances, after laboriously searching among the public and other records, and collecting and taking down the evidence of old people and others, and after being advised that the public right could be established, proceeded to raise a guarantee fund of £1,000, to cover the cost of any litigation that might be necessary.

"After giving formal notice of their claim to all the landowners, they sought and obtained (in May, 1895) an interview with the Duke of Devonshire, and laid before him an account of what they had done and were claiming, as well as some of the evidence on which they grounded their claim. Soon afterwards they had interviews with other landowners concerned, from all of whom, as from the Duke, they received courteous attention and consideration. In the end, after what may have seemed a long time, to those outside the necessarily tedious negotiations, the Committee were able to enter into agreements which received the assent of the landowners and their lessees, and also the approval of the District Council of Hayfield and the Hayfield Parish Council, as well as of the general body of members of the Society. On the terms of these agreements the footpath was conceded to the public in perpetuity.

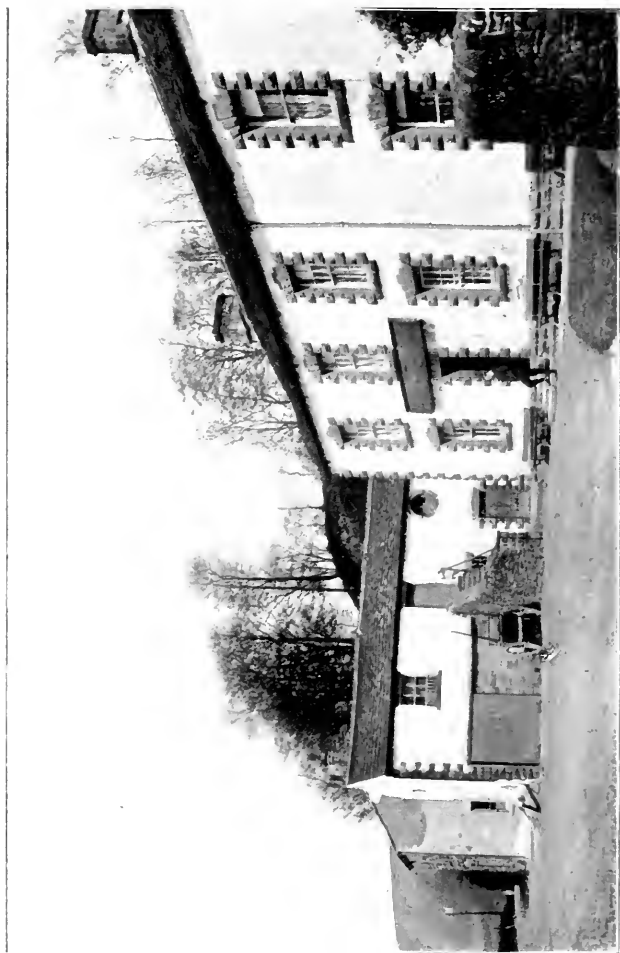
"Before this desirable result was arrived at, hundreds of meetings had been held by the Investigation and Managing Committees of the Association, and scores of visits had been paid to Hayfield, the Woodlands, Glossop, and Sheffield, as well as journeys made to Hope, Derby, London, and other places. In fact, no one outside the Association, or even outside its Managing Committee, has any idea of the amount of work done, or time consumed, in the investigations and negotiations. It is a happy coincidence that the celebration of the Society's successful efforts should take place within a few weeks of the commemoration of the Diamond Jubilee of our honoured Queen."

HAYFIELD.

The town of Hayfield is sixteen miles from Manchester, between which places a direct line runs through Marple. From Sheffield, Hayfield is reached by Godley and Woodley; or by Chinley or Chapel-en-le-Frith and New Mills; and from Derby by the last-mentioned route. The view here shown is from the lower part of Church Street, looking downwards.



ASLOP CLOUGH



SNAKE INN, WOODLANDS.

LEYGATE HEAD MOOR AND SHOOTING CABIN.

The open moorland is reached at this gate, from which the shooting cabin is plainly seen, though only barely visible in the photograph. The public path leads near but not up to the cabin; and visitors are earnestly requested by the Peak District Society to keep strictly to the path. The nearer part of the flat-looking moor, to the right in the photograph, is called Leygate Head Moor; and the distant mountain, with April snow upon it, is Kinder Scout.

KINDER VALLEY.

The view of Kinder Valley is taken from the gate across the Carr Meadow Bridle-way; this way passes through the plantation shown in the photograph, to the house, also shown (far below the point of view), known as Lower House; in the distance are two other farms, called Kinder Head and Upper House. Mrs. Humphrey Ward, prior to writing her "History of David Grieve," stayed at this house. Kinder Low is the mountain at the extreme right of the picture.

NAB BROW.

At this point on the path, the Carr Meadow Bridle-way has just been left. The Downfall is in the distant cleft shown near the centre of the hill line. From the extremity of the path shown in the picture the first view of Williams Clough is obtainable.

THE SHEEPFOLD, WILLIAMS CLOUGH.

The sheepfold, with its three or four blighted firs, is one of the first striking objects encountered on this very beautiful part of the route. The whole way through this romantic gorge is interesting and delightful; and when the works which the mason has had to erect in various places are toned down by time and exposure, its appearance will be as wild and as natural as it is possible for a way to be which is to be traversed by hundreds of people.

WILLIAMS CLOUGH.

A view of the upper part of the clough is shown. The path turns to the left from this point, and a pretty steep ascent over the heather has to be made before Mill Hill, the summit of the way, is reached. This summit is 1,670 feet above the sea.

HEAD OF THE ASHOP.

A view showing the character of the scenery near the summit of the path is faithfully shown. The height to the right is The Edge, an escarpment of Kinder Scout.

ASHOP CLOUGH.

This view is somewhat lower down the valley than the last one represented. The track visible on the right bank of the stream is not a public way. The distant Snake Inn is just visible at the point where the track turns the hill corner. The hill above the Snake Inn is known as Cowberry Tor.

TURNER FOLD.

The sheepfold of Turner Fold is said to have been formerly known as "Turnover Fold," a place where the shepherds of the district came together to "turn over" strayed sheep, and to arrange exchanges. It is situated on the right bank of the infant Ashop, and the new path goes close by, on the opposite bank.

NEAR THE JUNCTION OF THE ASHOP AND LADY CLOUGH BROOK.

A view of the lower part of Ashop Dale and Lady Clough shown is not taken from the public highway, but is given to show the general appearance of the country. In the distance, at the right of the picture, the bridge is shown which has been erected by the Peak District Society.

LOWER ASHOP DALE.

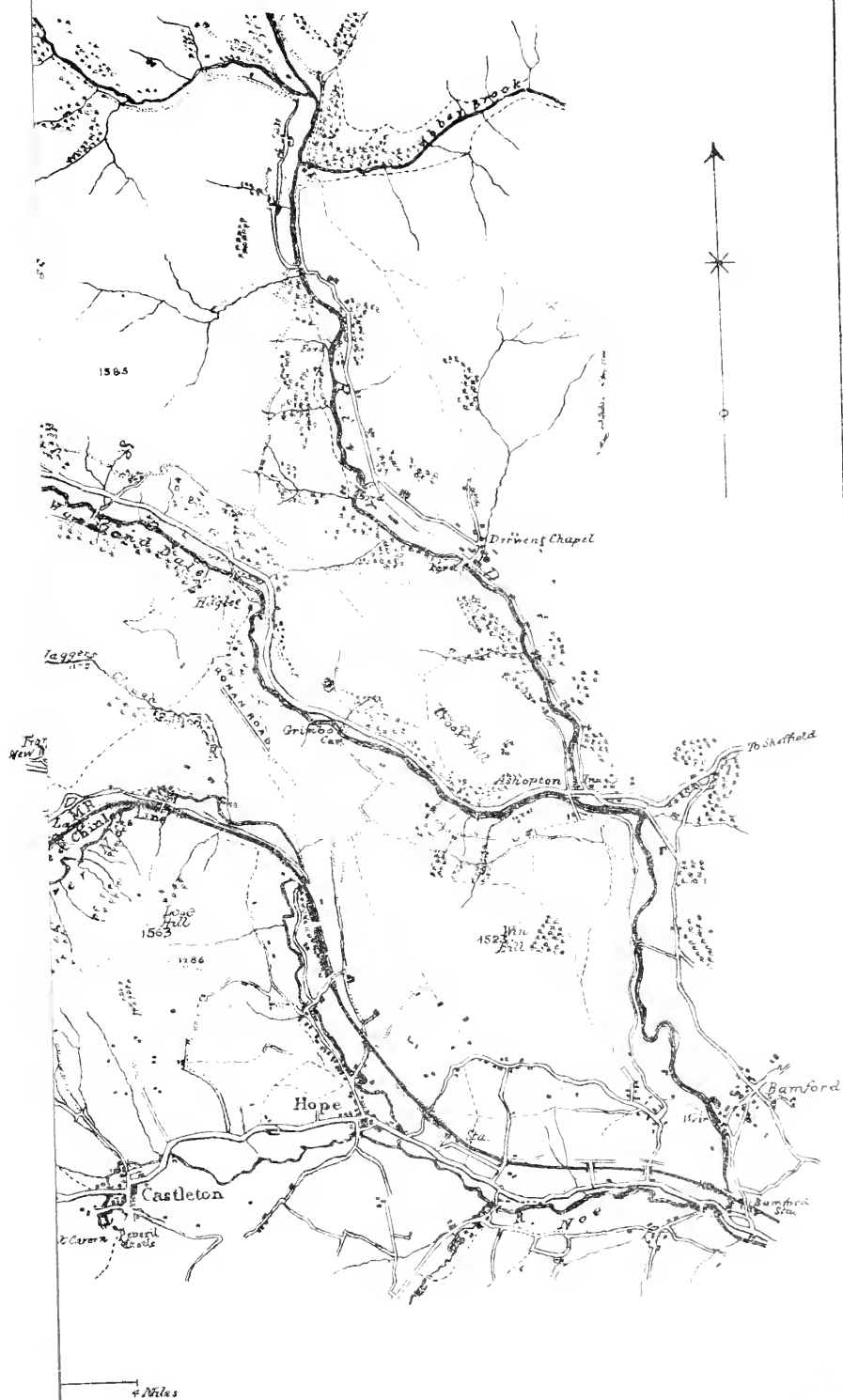
A view of Lower Ashop Dale is taken from near The Snake, and is one of the most charming in this beautiful valley; both tracks shown on the right, together with the little bridge (which is just seen) crossing the stream, are private ways made by the shooters. The course of the high road from Glossop to Sheffield is marked by the wall and telegraph posts on the left of the picture. The River Ashop joins the Derwent at Ashopton, about six miles away.

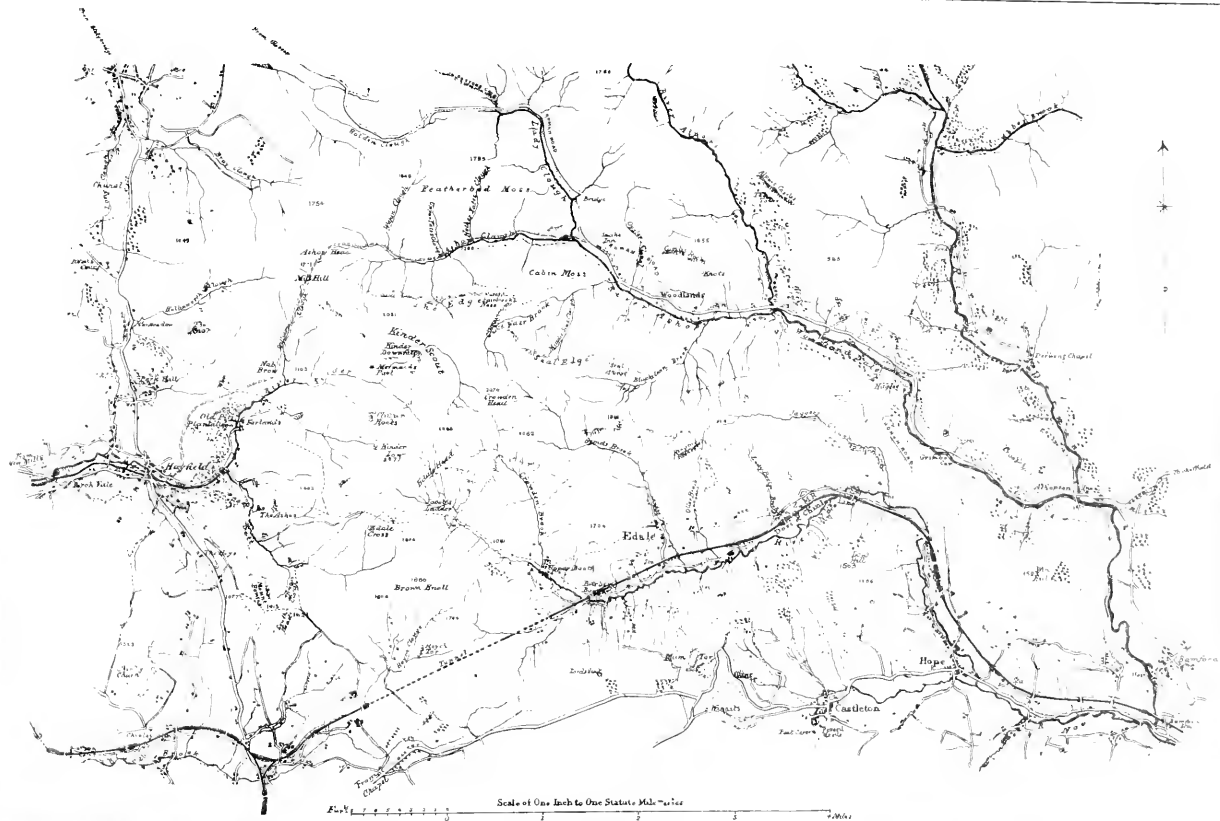
THE SNAKE INN.

The public path terminates at the high-road between Glossop and Sheffield, a little above the Snake Inn. The inn is situated seven miles from Glossop, about nine from Bamford (on the Midland Railway), and seventeen from Sheffield. The high-road which passes before the inn was formed between 1820 and 1825. It is one of the most picturesque roads in the country, and is interesting as being among the last of Telford's famous roads. The distance from the Snake Inn, *via* the Roman Road, to Hope Railway Station is seven miles, and by the same road and Jagger's Clough to Edale Station six and a half miles.

 THE MAP.

The Map shows the relation of the path to the other roads and ways of the Kinder Scout District. It is principally taken from the new one-inch Ordnance map. No attempt is made to show the forms of ground further than an indication of the steepest part of the rock escarpments of the neighbourhood. The path is six and a quarter miles in length from the point where it leaves the road at the Jumble, Hayfield, to its junction with the Sheffield high-road, near the Snake Inn. Commencing at a level of 700 feet above the sea, it rises to 1,200 at the point of crossing the Carr Meadow Kinder Bridle-way. It then falls to Williams Clough, the Sheepfold being exactly 1,000 feet above sea level. From thence to Mill Hill it rises more than 600 feet, the summit level being 1,670 feet. The Ordnance level mark on the Snake Inn is 1,060.





THE JOURNAL

OF THE

MANCHESTER GEOGRAPHICAL SOCIETY,

ALL ABOUT NORTH BORNEO, THE NEW CEYLON.

(With Map and Illustrations.)

By MR. A. TUCKER WARDROP.

[Addressed to the Society, in the Library, May 24th, 1897, at 7-30 p.m.]

NORTH Borneo is very little known, in spite of the fact that the island of Borneo is (next to Australia) the largest island in the world. During my stay in this country, I have found that nine out of every twelve persons do not know where Borneo is, one of the first questions they ask being: "What part of the world does Borneo lie in?" Many people know that there is a place called Borneo, because it is mentioned in a certain comic song, and because a noted racehorse is named "The Wild Man of Borneo;" otherwise, in all probability, those people would never have heard of the island.

The island of Borneo contains an area of about 264,000 square miles. The southern portion belongs to the Dutch and most of the northern part to the English. That part called the State of British North Borneo, of which I will give you a few particulars, is in extent about 31,000 square miles, and nearly 6,500 miles larger than the island of Ceylon. The coast line of the main land measures about 1,000 miles, and is, roughly speaking, of pyramidal form, the apex being towards the north; the China seas wash its western, and the Sulu and Celebes seas its eastern coasts. From a geographical point of view, the territory is favourably situated as regards commercial routes, being almost midway between Hong Kong and Singapore; while the course recommended on the Admiralty charts to vessels trading to China and Japan in the north-east monsoons, through the Palawan passage, brings them within 90 miles of the harbours of the west coast. On the other side, steamers trading between China and Australia pass within half a day's steaming of the most magnificent harbour and one of the largest in the world—Sandakan—which is the present headquarters of the Government.

VOL. XIII.—Nos. 10-12—OCT. TO DEC., 1897.

The following table gives the distances between Sandakan and the principal parts in the East:—

Sandakan to	Singapore.....	1,000 miles.
"	Hong Kong	1,200 "
"	Labuan.....	300 "
"	Manila	600 "
"	Sulu	181 "
"	Balungan.....	300 "
"	Macassar, Celebes	750 "
"	Port Darwin, Australia	1,500 "

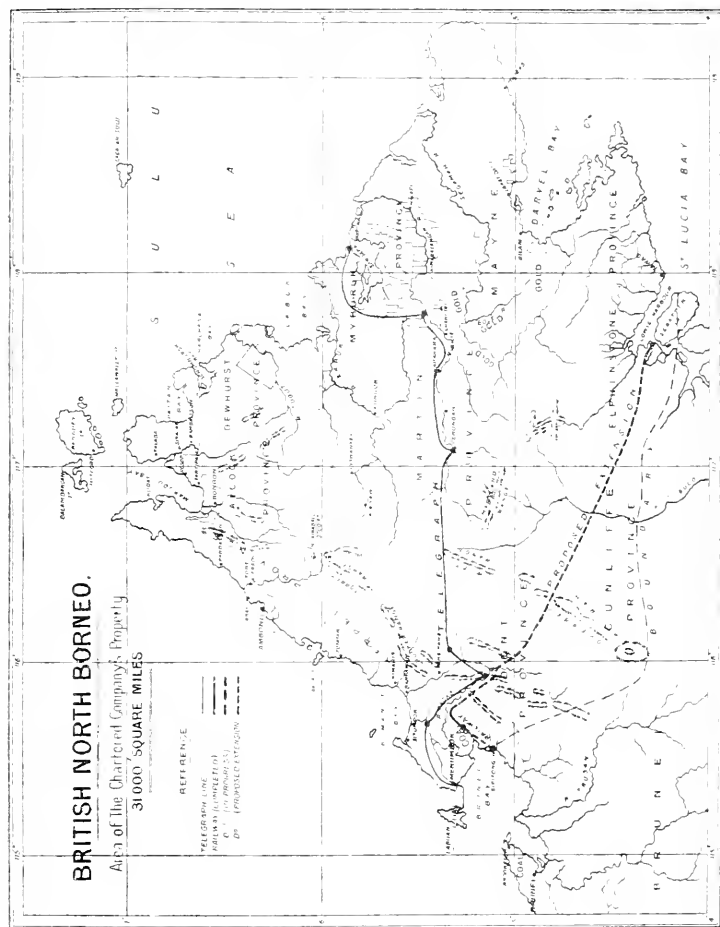


VIEW IN SANDAKAN.

Mempakal, the most westerly station in the territory, is only about 700 miles distant from Singapore.

The principal seaports of North Borneo are Sandakan, Kudat, and Gaya. There are very many smaller seaports at which the local steamers call, and there is very frequent communication by steamers or launches with all the ports and rivers. The country is not what would be called mountainous. The principal mountain is the great mountain of Kinabalu, 13,700ft. high; the other mountains range from 3,000 to 8,000ft. Borneo differs from all the other large islands (comprising what Wallace terms Australasia) in not possessing a single volcano, either active or extinct.

The country is well off for rivers. Kinabatangan river, on the east coast, is the finest, and is navigable for steam launches for over 200 miles. The Padas river, on the west coast, is another fine river, and is navigable for a long distance. It has on its banks many sago plantations, which are a source of considerable wealth to the inhabitants of the district.



The population of North Borneo is very scanty. Vast tracts of land on the east, west, and interior are simply uninhabited forests. On the west coast the population in some districts is fairly large; the want of people on the east coast is due to savages in old days, pirates by sea, and head-hunters by land.

The establishment of a firm Government in North Borneo put an end to all these irregularities some time ago, but at the cost of much trouble and expense. At first there was a slight difficulty in persuading the natives to a more orderly state of things, but now they are going on smoothly and quietly, except in some of the outlying districts. It is not an uncommon thing to see large bodies of people—men, women, and children—arriving from remote districts, generally under some grave and peace-loving chief, to settle under the Company's flag.

The climate of North Borneo is all that can be desired. Consumption is unknown, and a month's stay is a perfect cure for asthma. Although in Borneo, as in all tropical countries, those making new clearings in the jungle are liable to sickness, it is of a mild type and amenable to treatment. The chief diseases are fever, beri-beri, and dysentery.

The island of Borneo and surrounding seas are exceptionally rich in natural products. The sea products are trepang, keema, seed pearls, mother-of-pearl shell, tortoise shells, shark fins, turtle eggs, and all kinds of fish.

Trepang, or sea-slug, is collected principally by the Bajans or sea gypsies, who cure and dry it and bring it to market, where it is bought by Chinese traders and then sent to China, where it is much appreciated for making soup.

Keema is a large cockle or clam shell, which may often be seen in museums and such places in England. These shells are much used as vessels for holy water at the entrances of churches in European cities. They are sometimes found 6ft. in width. The Bajans collect these shells also.

Seed Pearls.—These are found in a thin, flat oyster, which occurs in shallow water, and at different places along the coast. The seed pearls are bought by the Chinese and sent to China, where they are pounded up and made into powder for the use of ladies who desire to improve their complexion—at least, such is the story.

Tortoise Shells.—The name applied to this article of commerce is somewhat of a misnomer, as the shell is supplied by the turtle. These turtle are fairly common in our seas, and are usually captured by spearing while asleep on the surface of the water.

Sharks' Fins.—Sharks abound in these seas, and the quantity may be described as inexhaustible. Borneo sharks are to a certain extent dangerous, but not very much so. The Bajans collect the fins and tails. The trade in sharks' fins, like that of most of the other articles hitherto mentioned, is carried on exclusively with China.

Turtle Eggs.—Some of the sandy shores of the islands about the east coast abound with turtle eggs, which are collected by Bajans, and quite a large trade is carried on. Great quantities

are always exposed for sale during the season in the Chinese shops in Sandakan. The natives are very fond of these eggs.

Fish.—Nowhere in the world, probably, is there such a quantity and variety of good edible fish swarming in the seas as off the east coast of Borneo. They resemble cod, rock cod, huge perch, whiting, herrings, haddock, soles, and millet. Sardines abound in large quantities. The natives use the keelongs chiefly for catching fish. It is made on the principle of a wire mouse-trap, from which, when once entered, it is impossible to escape. The Malays work these keelongs. It requires very little exertion or mental strain in working a keelongs, which suits the lazy character of a Malay. It is his one ambition to have a keelongs.

Crocodiles are sometimes found in the keelongs. The Government offer rewards to the natives for the heads of these dangerous monsters. Fish being so plentiful, a large salt fish trade has sprung up in Sandakan, and tons are being shipped to Hong Kong by every steamer for consumption in China.

Forest Produce.—The enormous extent of virgin forest affords an unlimited supply of the very best woods, which are suitable for any purpose. The different kinds of woods are far too many for me to enumerate, as also the numerous purposes they would serve, but if any information is required I shall be most happy to give it. A very large trade is now being carried on with China and Japan in Borneo timber, and two very extensive steam sawmills in Sandakan, beside small Chinese sawyers, are constantly employed.

Rattan is another forest product, and large quantities are sent away by every steamer. The rattan siga is the finest, and is used for making chairs. Other kinds of rattans shipped are used for making tiny tea chests, walking sticks, etc., etc.

Edible birds' nests are largely found in Borneo. They are of two classes, white and black. The trade is entirely in the hands of the Chinese.

Other forest products are guttapercha, indiarubber, beeswax, attaps, dammar, and camphor.

Minerals.—Gold was first discovered in 1883, and has been worked by the Chinese more or less ever since. A very influential syndicate has just been formed in London to work the gold, and as, according to the adage, money makes money, so undoubtedly it will be the case now of "gold making gold." Samples of tin, copper, cinnabar, mica, and other minerals, besides seams of coal and oil springs, are to be found all over the country. A spring in Kotei—Dutch Borneo—has just been found, yielding 35 tons of very good oil daily.

Agriculture—Tobacco.—It is, I think, needless for me to say anything about Borneo tobacco. It has been pronounced the finest tobacco the world can grow. It is used mainly for wraps

or covers for cigars, for which very high prices are obtained. Sumatra has hitherto been the chief producer of wrap tobacco, but Borneo tobacco fetched higher prices for its better lines last year than Sumatra did, and as last season's crops on most of the estates in North Borneo were very large ones, and as high prices are again being realised, results should be very satisfactory. Borneo cigars are now well known and the demand for them is steadily increasing. The North Borneo State Cigar Syndicate, of 26, Leadenhall Street, London, sell Borneo cigars exclusively, and their cigars are guaranteed by the Chartered Company, and they are excellent.

Before going any farther, it would be as well to give you a list of the products of the country; it includes tobacco, coffee, cocoanuts, sago, gambier, cotton, tapioca, sugar-cane, rice, betel nut, Manila hemp, nutmegs, cinnamon, pepper, rhea, cocoa, cotton flock, arrowroot, chillies, ginger, millet, Indian corn, and many others, besides the forest produce.

Now, where is there a country that opens such a field for the employment of British youth and British capital? Nowhere!!

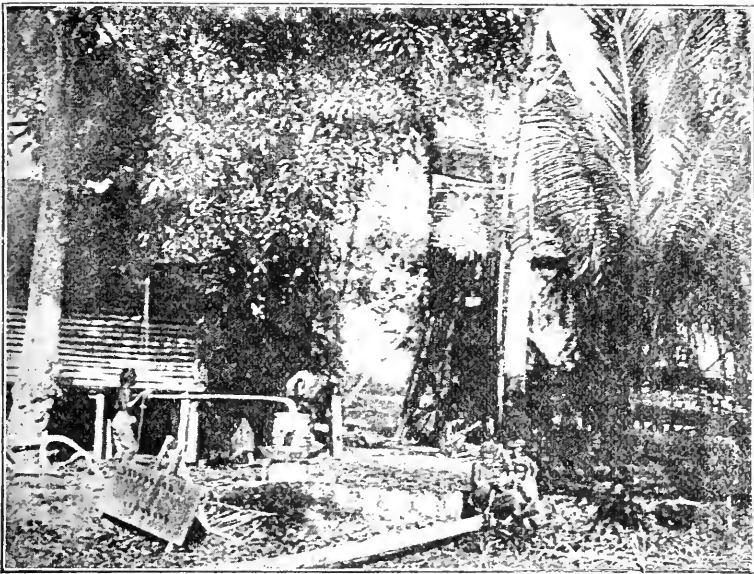
The Government of British North Borneo, according to the last papers received from Borneo, are prepared to make a limited number of free grants up to 500 acres of land for the cultivation of tapioca, coffee, tea, cinchona, etc. The land is available up to an altitude of 10,000ft. The profits of Liberian coffee estates now under cultivation are most encouraging. The fruit grown in the country includes: oranges, bananas, limes, lemons, pine apples, lychees, mangosteens.

Coffee.—The coffee grown in North Borneo is Liberian. According to Mr. Pryar, the oldest resident of North Borneo, the coffee grows faster and is healthier and larger there, and he, having coffee estates scattered all over the country, ought to be a good judge. The present price obtained for Liberian coffee is 64s. per cwt. against 40s. for good Rio. The amount of land in North Borneo suitable for coffee is practically unlimited. Coffee to the value of \$320,000 was exported from Sandakan during the year 1896—almost double the amount of the previous year. There is a grand field for coffee estates on the east coast of Borneo, and labour is both plentiful and cheap.

Now as regards cocoanuts, they seem to grow anywhere in North Borneo; cocoanut planting is all the time extending. I have such a belief in them that I am planting them myself. New uses for cocoanuts are constantly being discovered, the latest being for making butter. Thousands of tons of copra (the dried kernel of the nut) are imported into Marseilles and Barcelona for making oil, and as these ports are the largest exporters of salad oil, one can draw one's own conclusion as to what becomes of it all. There are now under cultivation near and around Sandakan over 1,000 acres of cocoanuts, and natives

are planting them in all their villages. Enough has been said about the cocoanut.

Cotton.—We will take cotton flock first. This grows very freely in North Borneo, and is remarkably easy and cheap to cultivate. The ground being cleared in the ordinary manner, all that remains is to obtain cuttings of cotton flock trees, the length of a stick, and stick them in the ground on a rainy evening. They grow up so quickly that in a very short time they are able to take care of themselves. In the latest report from Borneo the governor states that this tree grows like a weed, but the natives neglect it from sheer laziness. Accordingly he



COCOANUT PLANTATION.

gave orders for it to be taken in payment of fines, fees, etc., and then had it shipped to Hong Kong and Singapore, where it found a ready market at \$16, or about £3 6s. a cwt. The cotton indigenous to the country is long, is silky in staple and does not spoil with rain, and is valued from \$19 to \$25 per picul. Orders for thousands of piculs are to be had from Hong Kong and Japan, and there can be no doubt that there will be a very large export from North Borneo when its cultivation is properly started.

Manila hemp, technically known as *Musa textiles*, grows remarkably well in Borneo. I have shown you a photograph

of Manila hemp plants, which enables you to see for yourselves how they thrive. In time to come they will form a large export trade.

So it is with all the other products I have enumerated. It will thus be seen that British North Borneo is unusually rich in natural products. The only thing now required is capital.

The government of the Colony is administered by a Governor, assisted by a large staff of officers—Treasury, Land and Survey, Public Works, Harbour, Medical, Judicial and Constabulary Departments—in fact, the same as any other British colony. Native chiefs are in charge of villages, and are responsible to the Government for the good behaviour of the villages under their charge. The wild animals inhabiting the country are the elephant, rhinoceros, buffalo, deer, pig, bear, and orang outang. Sport is not much indulged in; those who go into the jungle go only on business, either for surveying, exploring, or path-cutting.

European life in North Borneo is, on the whole, very pleasant; neither religion nor education is neglected. There are two missions—one Protestant and one Roman Catholic; the former has churches at Sandakan, Kudat, and Labuan, and English missionaries, stationed in the interior, are doing good work. The Roman Catholic mission has several priests throughout the country; its headquarters are at Sandakan. Amongst the natives, especially the Dusuns, it has made many converts, and the schools conducted by the priests are much appreciated by all classes. At Sandakan there are the hotel, club, bank and insurance agencies, European and Chinese stores, public markets, hospital, Government House offices, gaol, barracks, saw mills, tennis grounds and race course, and numerous neat bungalows. Almost every European possesses a pony; these are brought over from Sulu. They are good and cheap, the price being from \$20 to \$60. The latest return from Borneo states that trade for Sandakan alone increased during 1896 by \$131,000 on the imports and \$164,000 on the exports. The coffee export has nearly doubled since 1895. Tobacco rose from \$301,000 in 1895 to \$398,000 in 1896, and nearly everything else is on the increase. The figures for the trade of the whole territory are not yet to hand. Now, it is hardly necessary for me to enlarge, especially in view of matters in South Africa, on the advantages to capitalists of investing money in a country that flies the British flag. As I have said before, Borneo is a country very little known, but within the next two years there is no doubt that British North Borneo will be as well known as British South Africa. The Government are making railways as fast as railways can be made. On the West Coast a considerable portion of railway is already completed, and the country is being rapidly opened up and levelled for extending the line.

The telegraph line is carried right across the country, and telegrams can now be sent and received from any telegraphic point in the world. This has all been done by the Government to keep pace with the times. Sandakan itself is covered with a network of telephone wires, the instruments being leased by the Government to the public; who have readily availed themselves of the convenience. Every office is now on the telephone. This illustrates how Sandakan is progressing. The Company commenced operations in Borneo in 1882, and when you remember that the country was the wildest and most savage in the East before the Company started, and is now orderly, peaceable, and wealth-producing, you must acknowledge that the British North Borneo Company have achieved a great success.

Were it possible for you to conceive a vast expanse of territory, covered from coast to coast with impenetrable jungle, inhabited by savage and cannibalistic tribes, infested with all sorts and conditions of wild and ferocious animals, and situate almost on the Equator itself, you would then be able to realise, to some extent, what was the condition of North Borneo when the Chartered Company, adopting as their motto, "*Pergo et Perago*," entered upon the herculean task of altering the aspect of the country, of civilising the natives, and of instituting a system of government under which one and all could work for their own mutual benefit, and for the benefit of the country as a whole.

Throughout the 15 years during which the country has been under their administration, great and sustained efforts were made in the desired direction, with results such as I have already indicated.

Where once the dark and dismal jungle spread,
We now have fields and decent roads instead;
From coast to coast on land before unknown,
Small towns are built and population grown;
Through places which the savage did infest,
The telegraph is carried East to West;
And thus a place ten thousand miles away,
Is brought in touch with England day by day.

In conclusion, I will confidently say that British North Borneo has a future of wealth and fame unsurpassed, if equalled, by any country ever known; and while the Directors of the Company continue on the work of progress, which they have so well begun, that wealth and fame will be realised much earlier, perhaps, than even my own most sanguine anticipations would suggest.

NOTE.—The public revenue, in 1896, was \$411,699; the public expenditure, in 1896, \$496,015; total imports, in 1896, \$1,882,188; total exports, in 1896, \$2,473,753.

SLIDES used by Mr. A. Tucker Wardrop, on "North Borneo."

Lent by North Borneo Company.

1. Map of Territory of the British North Borneo Company.
2. Orchid and Orang-Outang
3. Malay Chief, with Wife and Child.
4. Native Ploughing.
5. Upper Entrance to Penotal Gorge.
6. Dusun and Harrors, Putatan District.



NATIVE WOMAN GATHERING COFFEE.

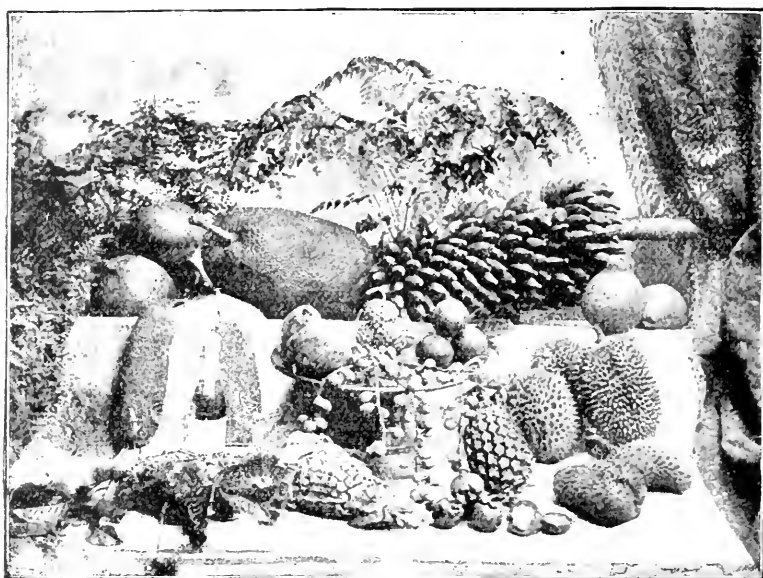
7. Coffee Estate in Sandakan.
8. The Fort, Kuchin, Sarawak.
9. Penotal Gorge, the Pass through which the Railway will go.
10. Brunei.
11. Chinese Tongkongs in Kudat Bay.
12. British North Borneo Dyak Police.
13. Wives of Dyaks in Full Dress.
14. Jungle.
15. Dyak Girl.
16. Kudat Harbour.
17. Coffee Tree.

18. Taratipan Coffee Estate.
19. Specimens of Borneo Fruit.
20. Road on Sahat, Datu Tobacco Estate, Darvel Bay.
21. Sawmills, Sandakan.
22. Government House (Sandakan). An At Home.
23. Group of Sulus.
24. Tobacco Plantation.
25. Sultan of Sulu and Princes.
26. Sulus Felling Timber.

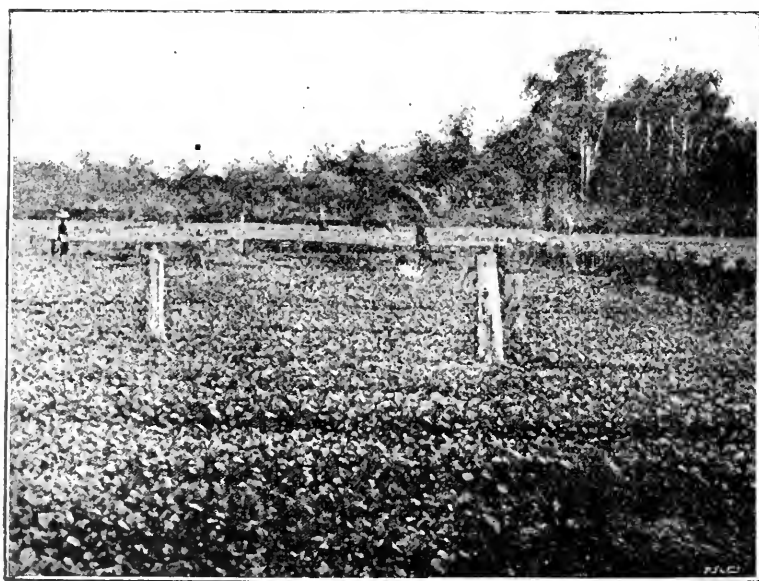


COFFEE TREES.

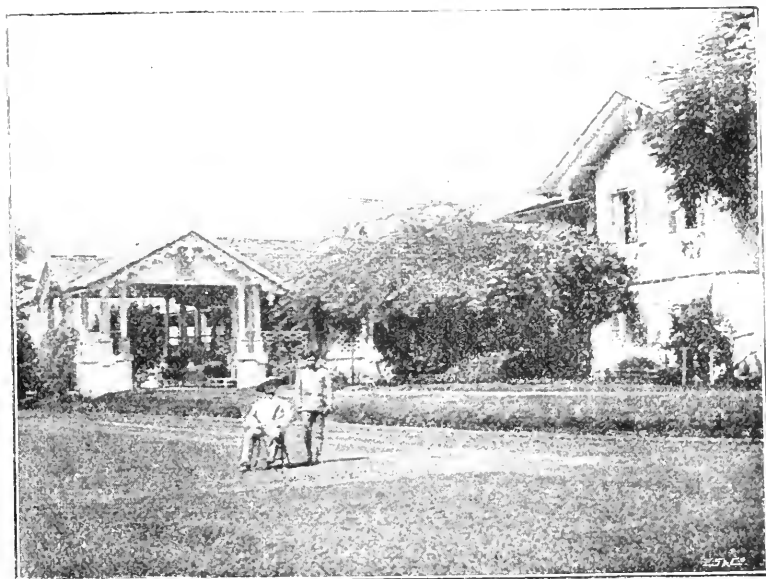
27. Murut and Hut.
28. Sarawak.
29. The Padas River, at Soongbanang.
30. Drad, Tambadan, or Wild Bull.
31. The Residency, Kudat.
32. White Bridge over Kudat Stream.
33. British North Borneo Constabulary.
34. The Istana, Sarawak.
35. Tobacco Plantation.
36. Scene on the Kinabatang River.



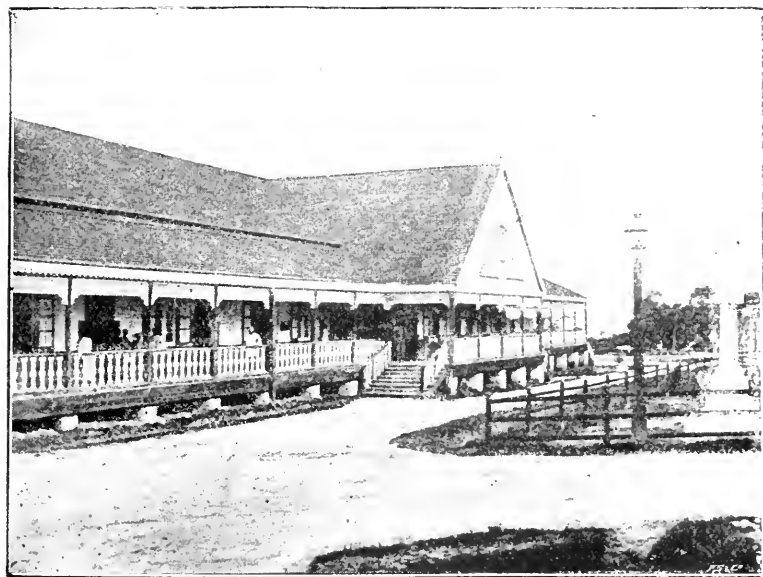
FRUIT OF THE COUNTRY.



VIEW OF A TOBACCO FIELD.



GOVERNMENT HOUSE, LABUAN.



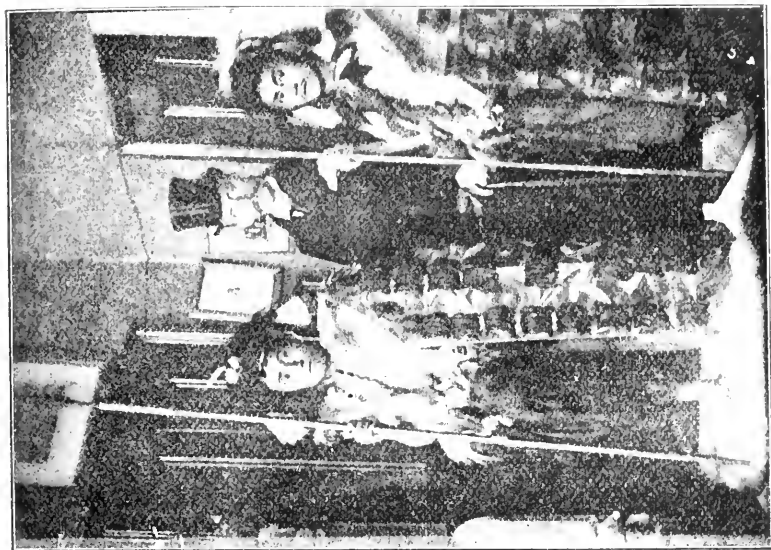
GOVERNMENT OFFICES, SANDAKAN.

37. An Orchid.
38. Labuan Harbour.
39. Government House, Labuan.
40. Padi Land.
41. Kinabalu Mountain, etc.
42. Sulus Taking an Oath.
43. Dyaks.
44. Scene in Creek.
45. Dusuns going Home from Padi Fields, Putatan District.
46. Daughter of Malay Chief.
47. Ships Coaling at Labuan.
48. Sandakan.



THE HON. SIR HENRY KEPPEL, G.C.B., D.C.L.,
Admiral of the Fleet.

49. Dusuns.
50. Manila Hemp Plants (Musa Textiles).
51. Bajou Kampong, Putatan Rivers.
52. Durbar at Sandakan.
53. Two Chinese Women.
54. Kuching, Sarawak.
55. Muruts.
56. Government Offices.
57. The Hon. Sir Henry Keppel, G.C.B., D.C.L. Admiral of the Fleet,
one of the Directors, who commanded H.M.S. Dido in Bornean
Waters in 1830.

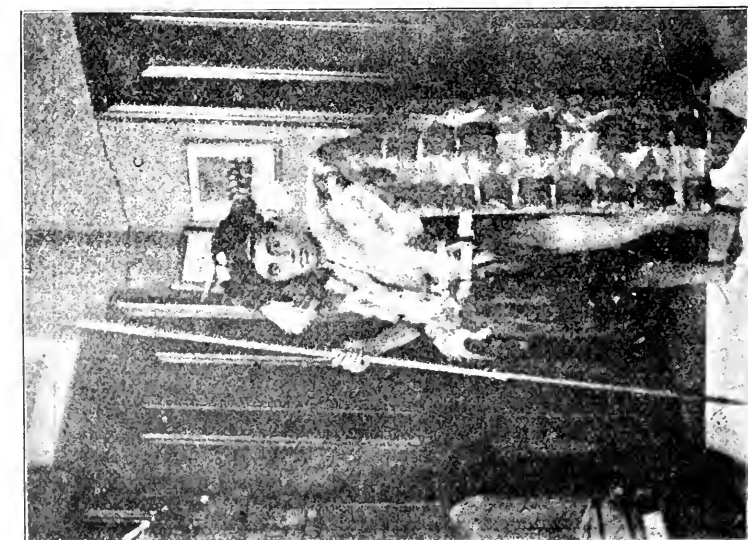


PRIVATE BOONSIE.
MR. WARDROP.

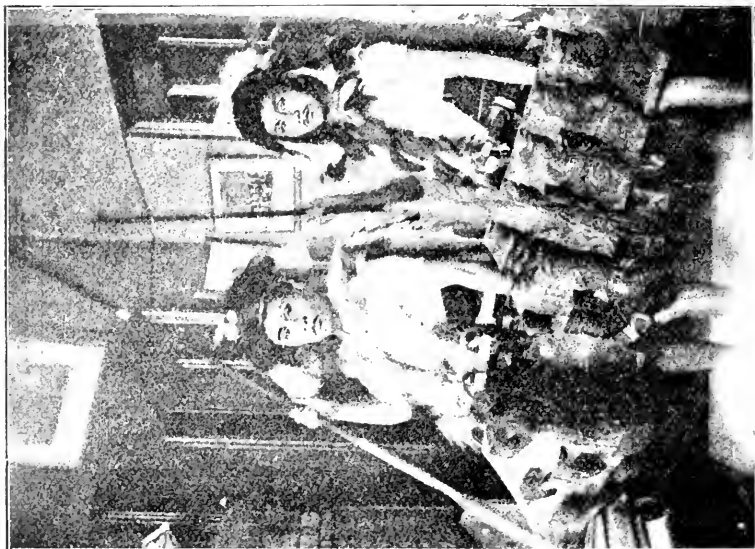
LANCE-CORPORAL OMBOL.



PRIVATE BOONSIE.



LANCE-CORPORAL OMBOL.



LANCE-CORPORAL OMBOL.

PRIVATE BOOSSIE.

The last four pictures are from Photographs taken at the Society's House by Mr. Tayton.-----

THE UPPER WATERS OF THE RIVERS IRAWADDY
AND MEKONG.

By the RIGHT HONOURABLE SIR RICHARD TEMPLE, BART., P.C., G.C.S.I.,
K.C.S.I., C.I.E., F.R.S.

[Addressed to the Society, in the City Art Gallery, Monday, March 28th, 1898,
at three o'clock p.m.]

SIR RICHARD TEMPLE said his purpose was to speak about the eastern half of the Himalaya and also the upper waters of the Indo-Chinese river system. When he last addressed the society he could not say he did not apprehend there would be grave political complications, but he hardly thought they would assume so rapid a development as they were now assuming. His present exposition would carry his hearers up to the very edge of the regions that were involved in these complications, and although the public mind appeared to be exercised to the extreme point of tension regarding current events, he for one was an optimist, and hoped that nothing would eventuate therefrom except what was good for the British Empire. He was not permitted to enter on politics, but if he were he would have no difficulty in showing that from these complications there might arise the most magnificent possibilities, in the future, for the British sphere of influence and British commerce. Proceeding with the immediate subject of his address, Sir Richard spoke of the remarkable grandeur of the eastern half of the Himalayan range. He described it as the most magnificent and the grandest scenery yet discovered upon earth. In the course of his former address he had alluded to the scenery of the western half as being the most beautiful in the world, so far as one knew, but in the scenery now under notice mere beauty yielded to grandeur and magnificence. He would conduct his audience to vast solitudes, to a desolate sublimity, to the very heights of desolation, and he would ask them to remember that from these vast solitudes and these interminable wastes there arose those mighty rivers which fertilised whole regions and enriched populations vaster than any that were to be seen in these latitudes, and would ultimately, of course, furnish the sinews for British commerce. Sir Richard then began an imaginary journey from the Mansarawar Lake, in Ladakh. Thereabouts rose, he said, the Sanpo, or South Tibetan river, which burst through the southern range of the Himalaya under the name of the Dihong, and joined the Brahmapootra, in Assam. In Tibet this river flowed between the northern and southern ranges of the eastern Himalaya.

This southern range had the finest groups of mountains yet discovered.

Sir Richard spoke of the grandeur of the scenery with the enthusiasm of one who was independent of books or photographs for his knowledge; the glories he depicted he had seen with his own eyes; the mountains whose majesty so much impressed him he had outlined with his own pencil and coloured with his own brush. He asked his hearers to look with him in imagination at one of the scenes. To the west were great rocks stretching out like the beaks of monster birds, and rhododendron trees thirty or forty feet high, with masses of bloom, purple, pink, orange, or straw-colour, and possessing so much colouring matter that if you pricked the bark the tree seemed to bleed. The leaves of these trees, moreover, were more than a foot long. In the background they saw gradually rising ridge after ridge in varied colours—purple, violet, grey—gradually diminishing till they got to the snowy range. Then one saw a long wall of snow from east to west, and from the midst of this wall there rose a snow-covered formation running as high as Mont Blanc. Imagine, he said, a long snow wall about the height of the highest Alpine peaks, and on the top of that imagine there was superimposed another mass of snow as big as Mont Blanc. He believed that apart from this no such imposing spectacle was ever heard of. He described three other scenes of the same character, though varying in detail. He next described the head waters of the Indo-Chinese river system, and indicated the relation which this geography bore to Yunnan—to the British railway which was, in the first place, projected from Siam towards the Yunnan plateau, but was not undertaken, and then to the second project, from Burmah towards the plateau, which had been undertaken and was actually under construction. This railway, he asserted, would assist us in reaching the Yangtse Valley, where were immense possibilities for British trade and enterprise. Once let the railway be made to Yunnan, and the upper valley would be ultimately open to us. With the railway at one end and Shanghai at the other, he need not tell what the results would be to British commerce by this extension of the British sphere of influence. He was not at liberty to touch upon the coming partition of what was called China, or of the fall of the Chinese Empire or kingdom; but China would not be partitioned so easily as some persons fancied. But whatever happened, whatever other Powers might choose to grab, or to take, or to annex, England would probably grab, or take, or annex nothing. She would do something far grander. She would, to the advantage of the human race and for the expansion of her Empire, and in furtherance of every other consideration, political, humanitarian, and commercial—she would take the lion's share of China for British commerce.

REPORT ON THE ELEVENTH INTERNATIONAL CONGRESS OF
ORIENTALISTS IN PARIS, SEPTEMBER 5TH TO 12TH, 1897.

To the Council of the Manchester Geographical Society.

MR. CHAIRMAN, LADIES, AND GENTLEMEN,

For the second time you have this year done me the honour of nominating me as your Delegate at the International Congress of Orientalists, held on this occasion in Paris,* as you did at the preceding Congress at Geneva in 1894.

As at the last Congress, so on this occasion, I duly forwarded to the Library of the Society the numerous official publications of various kinds issued day by day. They can be consulted by the members in the Society's Library.

I may remark, generally, that the Eleventh International Congress of Orientalists has been in every way a success. The number of adherents was reckoned at about 700. Almost every country of the world contributed distinguished Oriental scholars to the gathering, Eastern countries being particularly well represented. It is interesting to add that Manchester, besides your delegate, was also represented by the Rev. L. M. Simmons, M.A., the able Lecturer on Hebrew and Arabic at the Owens College.

The great cordiality of the reception afforded to us by all the French authorities, from the President of the Republic and the Minister of Public Instruction downwards, was a constant theme of pleasing comment. Indeed, in one respect it appeared to me almost carried to excess, inasmuch as by the regulations of the Congress French savants were actually excluded from the posts of president and vice-president of each section, which were reserved to foreigners, a rule which, in some instances, proved rather an inconvenience. Certainly, however, one effect of such gatherings must be to promote international friendliness, and to remove a large amount of international misunderstanding and jealousy. This idea was the keynote of many of the discourses delivered during the Congress.

It is my pleasing duty to convey to the Society the cordial greetings of our distinguished honorary member, Prince Roland Bonaparte, who assured me that he should from time to time forward to our library more of the valuable ethnographical photographs with which he has already enriched our collections. The Prince was a most active member of the Congress.

The Congress divided itself into the following sections:—

I. Aryan Countries:—

IA. India.

IB. Iran.

IC. Linguistic Science.

* The cradle of these Congresses, for the first of them was held in that city in 1873.

II. The Far East:—

IIA. China and Japan.

IIB. Indo-China, Malaysia, Polynesia.

III. Mussulman Languages and Archæology.

IV. Semitic.

IVA. Aramean, Hebrew, Phœnician, Ethiopian.

IVB. Assyria.

V. Egypt and Africa.

VI. Greece and the East, Hellenism, Byzantium.

VII. Ethnography and Folk-lore.

It will be seen from the above enumeration that the basis of the division of the sections was, as usual, mainly geographical; and also that this time there was no geographical section proper, as there was in the London and Geneva Congresses. Section VII., however (Ethnography and Folk-lore), before separating, passed a unanimous vote to the effect that "at the next Congress of Orientalists the scope of Section VII. ought to be enlarged, and its name restored as originally fixed at Geneva, viz., 'Geography and Ethnography.'"

In spite, however, of the absence of a specifically geographical section, it follows from the very nature of things that the communications presented to the various sections were, to a large extent, of a geographical character, taking the term geography in its widest sense. Hence to give a list of all the papers read in the various sections of interest from a geographical point of view would be doing little more than writing out the titles of a very considerable proportion of the memoirs presented by the numerous Oriental scholars who took part in the proceedings—not a very useful task. I will confine myself to a brief mention of a few papers which appeared to be of a more strictly geographical nature.

SECTION IA.—INDIA.

M. Foucher: "On the Itinerary of Hiouen-Tsang in Gandhâra."

Mr. Robert Sewell: "Some points in the Archæology of Southern India."

Prof. W. Geiger: "The Veddas of Ceylon."

Count Pullè: "On an Ancient Map of India."

Surgeon-Major Waddell: "The newly excavated Græco-Buddhist Sculptures from the Swat Valley."

Dr. Stein, Lahore: "Notes on Two Maps of Ancient Kashmir and Srinagar." [These maps have been carefully prepared by Dr. Stein in accordance with the data of the ancient "Chronicle of Kashmir" by Kallhana, as edited and translated by himself, and have been executed at the Survey of India Offices, Calcutta.]

M. H. Froidèveaux: "Note on the earliest French map of a settlement on the West Coast of India."

Mr. A. St. John: "The Position of Takkola."

SECTION II.A.—CHINA AND JAPAN.

M. Henri Chevalier: "On the City of Syou-ouen, in Corea."

Mr. Kisak Tamai: "A Japanese Traveller in Siberia in the 18th century."

SECTION II.B.—INDO-CHINA, MALAYSIA, ETC.

M. Aymonier: "Data furnished by the Inscription of King Yasovarman, of Cambodia, the founder of Angkor-thom, and probably the 'Leper King.'" [The earliest Buddhist monuments of Cambodia about A.D. 780, *i.e.*, before the erection of Angkor. Those of Boro Bandor, in Java, of the same date. The history of the Cambodians can be traced to the fifth century.]

SECTION IV.A.—SEMITIC.

Mr. H. J. Allen: "A Semitic Statuette found in Wales."

M. Raboisson: "Determination of the Situation of the various places called Mospha, or Mizpah, in the Bible."

SECTION V.—EGYPT AND AFRICA.

M. Moret: "Report on Explorations in Egypt since the last Congress."

M. Mercier: "Berber Topography of the Aouras Region."

SECTION VI.—GREECE AND THE EAST.

M. Hubert: "The River Orontes and its affluent the Saluara." [This affluent, hitherto unknown, is mentioned in a recently discovered inscription of Shahmanasar. Its identification is doubtful.]

SECTION VII.—ETHNOGRAPHY AND FOLK-LORE.

Dr. Hamy: "The Stone Age in Indo-China." [Extensive and remarkable discoveries have been made during the last few years by MM. Roux, Aymonier, James, Yersaint, and the Pavie Mission. Lacustrine villages, with numerous worked stone implements, have been discovered in Lake Ton-le-Sap, and other objects have been found in the country of the Ba-hmars. The results confirm the theory of the kinship between the ancient populations of Indo-China and those of Malaysia.]

M. Chantre: Report on his Mission in Cappadocia: discovery of numerous relics of the Stone Age.

M. Chaffanjou: "Settlements of the Stone Age at Kiakhta [jade axe-heads found], and on the shores of Lake Baikal [black flint implements]."

Discussion on the origin of Jade. [The result arrived at was that, whilst only jadides exist in Europe, deposits of true jade are to be found in Northern Mongolia and Southern Siberia.]

M. Benloew: "Note on the manuscript Map of Kiepert, and discussion of the origin of certain geographical names on the East Coast of Greece and in Asia Minor."

M. Deniker: "Russian Explorations in Central Asia, 1873-95." [Especially those of Prjevalsky, Pietrof, Radlof, Potanin, and the Kalmuck priest, Baza Bakteha Munkundjief, who in 1894 penetrated to Lhasa, and wrote in his own language an account of his journey, which has been translated into Russian and published by M. Pozdnief.]

M. Chaffanjou exhibited a remarkable collection of objects brought back by himself from Turkestan, Mongolia, and Siberia. [Particularly from the ruins of Afraciab, the ancient Samarkand, and Peikent, the ancient capital of Sogdiana; a collection of Mongol skulls, photographs of the public and private life of the people, specimens of enamelled bricks, etc.]

M. Hamy: "Ethnography of Asia and America." [Discussed the vexed question of the common origin of the races and civilisations of the two opposite shores of the Pacific. The younger American school is hostile to the Humboldtian theory. But the more recent and exact photographic reproductions and rubbings of the ancient American monuments leave no doubt about their analogy with those of Indo-China and Java. The Americans are preparing an expedition on a large scale to study the coast populations of North-Western America and South-Eastern Asia. The results will be presented to the next Orientalist Congress.]

M. Grenard: "Ethnography of East Turkestan, Tibet, and China." [Origin of population of East Turkestan; survival of ancient pagan religions here and in Tibet; origin of the Salar Turks of Kan-Sou.]

M. Rey de Morande: "Ancient civilisations of the Nile Valley and the race of the Akkas or Pygmies."

Perhaps of more interest—and often of more practical influence—than papers read, are the resolutions formulated by the various sections and eventually adopted by a general vote of the entire Congress in plenary session. More than once in the past these weighty resolutions have influenced the European Governments in the cause of scientific exploration or other enlightened measures. This year these formal resolutions were unusually numerous. One of them being directed specifically to all Geographical Societies must take precedence, and, as your delegate, I feel it my duty to communicate it at once to the notice of the Council. It is as follows:—"The Congress of Orientalists of 1897 addresses to the Geographical Societies of different countries, and also to the India Office, a request that they would undertake the chronological classification and the publication of the maps which have been compiled at various dates of different Oriental countries."

But the greater part of the "vœux" thus adopted were of a nature peculiarly gratifying to the British members of the Congress, for they took the form of votes of thanks to either the Indian Government, or to the local authorities in India, for measures of enlightened patronage already adopted by our administration. I give an abridged translation of these:—

1. "The Congress thanks the Indian Government for the measures taken to secure the preservation of Buddhist Sculptural Monuments in the Swat mountains and valleys and neighbourhood. It especially

thanks Sir Charles Elliott, Lieut.-Governor of Bengal. It desires to urge upon the Indian Government the pressing necessity of carefully watching over amateurs who often cause great damage by carrying away fragments of these sculptures."

2. "The Congress recommends to the especial notice of the Indian Government the eminent services of Major H. A. Dean, C.S.I., Political Agent for Swat, Dir, and Chitral, for his protection of the ancient monuments of the Swat region."

3. "The Congress thanks the Government of India for the recent discoveries made at the birthplace of Buddha, and hopes that measures may be concerted with the Government of Nepal for further explorations during the cold season."

4. "The Congress warmly thanks the Government of Nepal for the facilities accorded for explorations at Kapilavastu and Lumbini, which have resulted in the most important archaeological discoveries of the century."

5. "The Congress expresses its lively gratification for the munificence with which the Government of Bengal, under the administration of Sir Charles Elliott, Lieut.-Governor, has opened an 'Asoka Gallery' in the Indian Museum."

6. "The Congress expresses its lively gratitude to the Indian Government for giving effect to the recommendation of the Vienna Congress (1886) in favour of a language census of India; and wishes to lay stress on the value of this undertaking when completed."

7. "The Congress thanks the University of the Panjab and the Government of Kashmir for the invaluable aid which, at the instance of the Geneva Congress, they have lent to the researches of Dr. Stein."

8. "The Congress thanks the Government of Ceylon for its encouragement of historical research by the publication of the 'Archæological Reports'; of the 'Mahavamsa,' and other ancient documents, and hopes that the Government will continue the work so happily begun."

Besides emitting these cordial votes of thanks, the Congress took occasion to recommend the example so given to other Governments; thus it invited the Government of Burma to undertake the exploration of the sites of the ancient cities of that country, and strongly urged upon the French Government the desirability of protecting the ancient monuments of Indo-China.

Perhaps one of the most practical results of the Congress, and one destined to bear most valuable fruit, was the decision to create an "International India Exploration Fund" on the model of the already existing "Egypt Exploration Fund," and "Palestine Exploration Fund." The seat of the new institution is to be in London, and the following were selected as an organising committee:—The Right Hon. Lord Reay, President R.A.S.; Sir Alfred Lyall, M. Emile Senart, Professor G. Bühler, Professor Pischel, Professor Serge Oldenburg, and Count Pullè.

Before the Congress separated, an invitation from the Italian Government for the holding of the next Congress in Rome in 1899 was unanimously accepted.

This is, perhaps, hardly the place for more than a passing reference to the various social entertainments offered with unstinted hospitality to the members of the Congress, including numerous evening receptions (*e.g.*, at the Hôtel de Ville, at the Ministry of Public Instruction, and in the splendid palace of Prince Roland Bonaparte, whose library was a special object of attraction), and also the interesting visits to the Oriental Collections of the Louvre, the Musée Guinet, the Bibliothèque Nationale, and the Imprimerie Nationale—all four of very particular interest to Orientalists. Visits to the famous catacombs and *égouts* of Paris were also organised by the municipality of that great city; and the entire proceedings were happily closed by a splendid banquet, “offered by the French members of the Congress to their foreign confrères,” in the Hôtel Continental, and appropriately presided over by the Minister of the Colonies.

Your obedient servant,

December 1, 1897.

L. C. CASARTELLI.

NEW BOOK.

“HISTORY OF ARMENIA” (ILLUSTRATED), FROM THE EARLIEST AGES TO THE PRESENT TIME. By N. TER GREGOR. JOHN HEYWOOD, Manchester, 1897. 232 pp. (No Index.)

THIS is an interesting book, written by an Armenian, and gives the history of this country from an Armenian point of view.

The story is simply told, and is most valuable. It is, we may say, the history from the inside view, and not from that we are so accustomed to, from the view of this wonderful country from outside. The volume will well repay perusal.

NEW ATLAS.

“ATLAS UNIVERSEL DE GÉOGRAPHIE. Constitué d'après les sources originales et les documents les plus récents, cartes, voyages, mémoires, travaux géodésiques, &c. Avec un texte analytique. Ouvrage commencé par M. VIVIEN DE SAINT-MARTIN, et continué par FR. SCHRADER. 87 Cartes gravées sur cuivre sous la direction de MM. E. COLIN et DELAUNE. Paris: LIBRAIRIE HACHETTE ET C^{IE}.

THIS beautiful Atlas is being published in parts at two francs each, of which several are now issued.

The work is done with the care usually bestowed upon work done by Messrs. Hachette & Co.

The Maps are of fair size, are carefully drawn and delicately coloured.

The analysis to each map is useful, as showing the authorities upon which each map is based.

As an example of fine cartographic work, and one of the latest products of the French press, the Atlas, when completed, will be a very desirable work to have for reference, and will be up to date.

CONFERENCE OF MISSIONARIES ON GEOGRAPHY,

Friday, October 29th, 1897, at 3 p.m., in the Library of the Society, the Rev. S. A. STEINTHAL in the Chair.

A letter of invitation had been sent to a large number of missionaries at present living in Manchester or the neighbourhood. The Chairman called on the Secretary to read the letter of invitation.

THE CIRCULAR OF INVITATION.

MANCHESTER GEOGRAPHICAL SOCIETY,
16, St. Mary's Parsonage, Manchester,
September 20th, 1897.

CONFERENCE OF MISSIONARIES.

DEAR SIR,—We have the pleasure to invite you to take part in a Conference of Missionaries.

The subject to be considered is generally, the relation of geographical work to the work of the missionary, and the obligations under which geographical science has been laid by missionaries.

The practical outcome of the Conference, we hope, will be some suggestions to the society by which missionaries in the field may be brought into contact with the society.

We are glad to say that many missionaries are already in correspondence with the society, and many of them have expressed their pleasure in having a medium through which their accumulated and special knowledge can be made of public use.

The Lady Mayoress (who spent some time in China as a missionary) has kindly consented to be present and take part in the meeting.

The Conference will take place in the library, at the above address, at three o'clock in the afternoon, on Friday, October 29th, and after the Conference tea will be provided for the members attending.

Your early reply would very much oblige, and we trust you will make an effort to be present. We shall be glad to provide for your railway expenses.—Yours truly,

ELI SOWERBUTTS, F.R.G.S., etc., Secretary.

A large number had responded to the invitation, amongst those who had replied, who were not able to be present but who approved of the idea, were the following:—

Rev. W. S. MICKLETHWAITE (Tikonko, Mendi Country, Sierra Leone), Upper Witcheffeld, Shelf, near Halifax, October 14th, 1897.—Dear Sir,—You must please excuse me for not having written in answer to

your communication, inviting me to attend the Conference of Missionaries, to be held on the 29th of this month. For the invitation I thank you very much. I cannot say whether I shall be able to attend the Conference, as I may be away on deputation work. I shall be pleased to attend if possible, however, and sincerely hope that the Conference may be made a blessing to all who are able to attend.

REV. THOMAS CHAMPNESS (Sierra Leone and Abeocuta), Rochdale.—My Dear Sir,—I very much fear that I shall be in Yorkshire on the day when you so kindly invite me, so shall not be able to do myself the pleasure.

REV. WILLIAM VIVIAN, F.R.G.S. (Sierra Leone), The Manse, Birkenshaw, October 1, 1897.—Dear Mr. Sowerbutts.—Thanks both for the type-copy and for the invitation to the Conference. Unless unavoidably prevented I hope to come to your Conference. I think it a very capital idea, and one that should bear much fruit. If only I had had such an opportunity before I went to West Africa I am sure I could have made a very much better use of my time in respect to geographical subjects.

THE BISHOP OF SOUTH JAPAN, Church Mission House, Salisbury Square, E.C., October 1st, 1897.—Dear Sir.—I am sorry that an engagement in the end of October will not allow of my getting to Manchester for the 29th inst. Accept my sincere thanks for the kind invitation of the Committee. I should have been pleased to attend had it been possible.

REV. J. T. F. HALLIGY, F.R.G.S. (Lagos and Abeocuta), The Parsonage, Park Street, Bolton, September 22nd, 1897.—Dear Sir.—I am greatly disappointed that I cannot be with you on October 29th, as I am engaged for missionary deputation work in the Newcastle district from October 24th to November 6th. The idea of such a Conference as you announce is a very happy one, and must be helpful both to geographical and missionary interests, and I trust you will have a most successful meeting.

REV. J. C. SOWERBUTTS (India), Plymouth, October 2nd, 1897.—Dear Sir.—Many thanks for your Missionary Conference notice. I don't know that I can offer any *practical* suggestion. I think you ought to have one or two *short papers* in each session, to prevent discursiveness and waste of time. The idea is a capital one, and will do good. I should invite the leading ministers of Manchester. The Rev. Samuel Langdon, Wellington, Salop (Wesleyan), Ceylon, would do you good service if you could get him. He is a scientist and literary, and well up in Ceylon.

After the Secretary had read the letters, the Chairman said—It is my pleasant duty to welcome this gathering on behalf of the Geographical Society. We are all interested in the spread of geographical knowledge, and acknowledge with gratitude the debt which our science is under to missionaries. We are not here to-day to speak of the more sacred work to which they devote themselves with so much self-sacrifice—the preaching of the Gospel, with all its holy messages of righteousness and comfort among the heathen, or to discuss their noble efforts to carry the light of Divine truth into the dark places of the earth. We honour these labours, and those who spend their lives in the service

of their brethren. But we have asked you to meet us here to-day to consult as to the means by which you can promote the knowledge of geography, and can make use of the peculiar opportunities your work gives us, in increasing our acquaintance with the conditions under which those to whom you minister spend their days, and the character of the countries in which they live. You must have seasons of leisure, when you rest from the special work which has taken you abroad, and when you need some change of work to obtain refreshment for your minds and a renewal of strength to resume your sacred duties. We feel assured that in these periods of rest you can obtain information which would be most valuable to students who have not the opportunities which you possess. Many of your colleagues have done priceless work in philological study, many have described the habits and customs of the tribes among whom they have been labouring, have accumulated information in various branches of natural historical knowledge, and have acquired accurate and topographical acquaintance with the countries in which they have resided. But we feel convinced that if practical means were adopted much more could be done even than has already been accomplished, and we have taken the liberty of inviting you, whose interest in Geographical Science is so well known, to meet on a platform where no denominational distinctions divide us, to ask you to express your opinions freely on this important subject. We know that it must always be a subordinate matter to the holy purpose to which you have consecrated yourselves; but we believe that using your leisure for so noble a purpose will strengthen you in your more sacred work and provide you with means of more efficiently influencing the people whose highest interests you are striving to promote. I do not wish to occupy much of your time, but simply desire to say why we have taken the liberty of calling you together here to-day, and to ask you to suggest, as freely as you can, the methods by which missionaries can be enabled to promote the study of that science, the extension of which is the aim of our Society.

At the conclusion of the Chairman's address, he called upon the Secretary, who said:—The idea of this Conference had arisen in his mind from the large correspondence he had with missionaries in the field, and the great debt the Society was under to missionaries who, on their return, had addressed the Society. Amongst those to whom the Society was particularly indebted were—the Rev. S. Macfarlane, L.L.D. (New Guinea); the Rev. E. Dunn (Borneo); the Rev. G. Owen (Pekin); the Right Rev. the Bishop of Manchester, Dr. Moorhouse (Victoria); the Rev. G. Grenfell (Congo); the Rev. W. C. Porter, M.A. (Magwongwara); the Rev. T. Wakefield, F.R.G.S. (East Africa); the Rev. J. Mackenzie (South Africa); Bishop Hanlen (Ladak and Victoria Nyanza); the Bishop of Nyasa (East Africa and Nyasa); the Rev. L. Scott (Nyasa); the Rev. C. E. Somerset (Calgary); the Rev. F. Robinson (Hausaland); the Rev. W. Vivian (Sierra Leone); the Rev. F. Galpin (China); the Rev. J. T. F. Halligey, F.R.G.S. (West Africa, and many others; and it was to be noted that one of the founders of the Society, H. E. Cardinal Vaughan, was also a returned missionary. The result of this upon the minds of the Council was a desire to ascertain if any means could be found to obtain from missionaries in the

field, who are qualified, communications on the geographical facts continually brought to their notice, and, on the other hand, if the Society could in any way help the missionaries who desired to communicate the result of their knowledge and experience. The idea of this Conference thus took birth, with the satisfactory result of this large meeting. Some time ago we printed and circulated a very suggestive paper by Dr. Klein on this subject. In all departments of knowledge the missionaries of an older time gave precise and valuable information, and this was looked upon as a useful portion of their work. The older missionary records are full of valuable information, and those of to-day are able to collect and place on record for use at home their valuable information. But unfortunately a large part of this is necessarily lost or is not used, and the practical end of this Conference we hope to be to receive from the distinguished missionaries, and their wives, who are here present, some suggestions of value to enable the Society to bring about this result.

At the conclusion of the Secretary's address, he read the following contribution from the Very Rev. L. C. Casartelli, M.A., Ph.D., Rector of St. Bede's College.

Letter from the Very Rev. L. C. CASARTELLI, M.A., Ph.D., Rector of St. Bede's College, on the Geographical Missionary Conference:—

October 26th, 1897.

DEAR MR. CHAIRMAN,—For reasons which I have explained to our Secretary, I am unfortunately unable to take personal part in the Conference on Friday, much as I regret my enforced absence. The idea of the Conference, which I take to be to encourage foreign missionaries in doing what they can towards the promotion of geography and kindred sciences, for which they enjoy unrivalled opportunities, has my entire sympathy. I have always endeavoured, in the conduct of the missionary periodical which I have had the honour of editing for the last nine years, to urge upon our Catholic missionaries in various parts of the world—the only ones, of course, with whom I come into contact—to do a great deal for the cause of science in general, especially of the geographical group of sciences—not, indeed, in any way as a primary, but quite as a secondary and subordinate occupation, and yet even so in a most efficacious manner.

Thus, I wrote in a leading article in the issue of October, 1892:—“There must be no mistake. A Catholic missionary's first work and duty is to preach the Faith to the people he is sent to. This is his second duty, this is his third duty also. And when he has gathered together a small flock of believers, it is still further his duty to pasture them with the Word of Life, and to minister to their spiritual needs by the Sacraments and all the means of salvation. He must never become the mere *savant* or explorer. But it is a noble thing that in his moments of leisure he should make use of his unique opportunities to advance the cause of science at large, by making known to the scientific world the natural history, the physical geography, the history, ethnology, or folk-lore of the peoples among whom he dwells. Moreover, the better knowledge that is thereby gained of the lands and peoples who are to be evangelised is of the greatest help to those

who are afterwards to come in and toil in the same field." (*Ill. Cath. Miss.*, Vol. VII., p. 89.)

Moreover, I have endeavoured, from time to time, to stimulate the interest of our missionaries in work of this nature by recalling to them what their predecessors in the past have been able to accomplish for various branches of science, and that without any loss to their higher and nobler purely spiritual aims and efficiency.

Thus, following Father Dahlmann, S.J., who has since become himself one of the leading Sanskritists of Europe, we published a series of articles entitled, "Catholic Missions and Linguistic Science," in the introduction to which occurs the following passage:—

"We have, in former numbers, had something to say of the good that may be done by our Catholic missionaries in the cause of science. And we have laid down the warning that the true missionary must not degenerate into the mere scientific pioneer. His scientific labours must always occupy a very subordinate position to his real duties. Nevertheless, as Max Müller has stated, the most successful missionaries have been precisely those whose names are held in reverence not only by the natives among whom they labour, but also by the learned in Europe ('Essays,' Vol. I.). As a matter of fact, 'missioners ought to be the pioneers of science,' remarks the *savant* just quoted. (*Op. cit.*, Vol. VII., p. 104.)."

To point the lesson, we later on showed that—to take only the indebtedness of the science of comparative philology to foreign missionaries, the "first European Sanskrit scholar," to quote the title given him by Max Müller ("Lectures on the Science of Language," Vol. I., p. 174) was Father de' Nobili, S.J., the Indian missionary, about 1620; the first pioneer of comparative philology, based on the study of Sanskrit, was another Jesuit missionary, Gaston Coeurdoux, 1767; the first European to print and publish a Sanskrit grammar, and likewise the first professor of Sanskrit in Europe, was the humble Carmelite missionary in India, Fra Paolino a San Bartolommeo, 1790-1805. (*ib.*, p. 120.)

Noblesse oblige, and the moral to be drawn was that our missionaries of to-day might very well do their best to follow the example of those of the seventeenth and eighteenth centuries, not in India alone, but also in China and Japan, and other lands, to which I had not space to refer in detail.

Nor are bright examples wanting in our own times. I was able to recall to my readers that in Siam, Bishop Pallegoix (1850-62) laid the foundations of the study of the Siamese language, and his works are still the standard authority; that in Malaysia, Père Favre (1866-80) has produced the standard works on the Malay language; that Father Torrend, S.J., still labouring in South-East Africa, has been the "Bopp of the African Bantu languages," by his great comparative grammar; that an equal, if not greater work, not only for the languages, but also for the ethnography, of the Canadian Indians, is being done at present by the Oblate missionaries in the far North-West, more particular by Father Morice for the Déné tribes. Only last August, again, the London *Times* devoted a lengthy review to the invaluable pioneer Somali dictionary and grammar just brought out by the Capuchin, Father

Evangelist, of Berbera. These remarks apply chiefly to linguistic science, but it is clear that they are equally applicable to all others of the geographical group of sciences, including natural history. It is well known, for instance, that in our own time the Lazarist missionary in China, Père David, has enriched the science of zoology with quite a long list of new animals, several of which have been called after his name. As an example of what can be done for cartography, I beg to submit to inspection the missionary atlas of my friend Father Launay, of the Cochin China missions.

You will, therefore, understand what a peculiar pleasure it was to me to be allowed to present to the International Congress of Orientalists in London, in 1892, the collection of 148 Tibetan folk-songs, with translation and commentary, made by Father (now Bishop) Hanlon, in Ladak, being gathered by him from the mouths of the popular ballad-singers; and to that of Geneva, in 1894, the monograph of Father Prenger upon the Dusuns of Borneo, with a collection of their curious riddles. I look upon these two little works as models of what our missionaries can very usefully do.

The conclusion of this too lengthy communication, then, is that our Geographical Society is doing an excellent thing in bringing home to the minds of foreign missionaries the admirable opportunities they enjoy of doing very much for the cause of science in every department, and in stimulating them and directing their efforts so that they may do still more in the future than they have done in the past. I wish the meeting a great success.—I remain, dear Mr. Chairman, faithfully yours,

L. C. CASARTELLI,

Editor of "Illustrated Catholic Missions."

After the reading of the foregoing letter several missionaries addressed the meeting, amongst others the following:—

The LADY MAFORESS, Miss ROBERTS (China).—Mr. Sowerbutts asked me if I would say something to-day on the customs of China. There are so many here I could not think of such a thing. Perhaps I may say a word about what Mr. Sowerbutts has said. Missionaries must be looked at as specialists, and as specialists in religion; and that is why they do not take interest in many things such as this society does. True, the best missionaries can combine some of this work with their missionary work, but very few men can do more than one thing well. Some can; and with little effort and expense of time can write and send communications to such a society as this. This is all I can say in the presence of so many distinguished men.

Rev. THOMAS WAKEFIELD (East Africa).—I feel a little mixed with regard to this Conference of Missionaries, inasmuch as I do not know the exact shape the meeting is to take, or what is definitely expected from the speakers. I have taken a great interest in this society since its formation. I like its elasticity and comprehensiveness. I like the fact that the missionary was taken into the confidence of scientific men,

and asked to do something on the broad lines of this society. Every mission field is full of opportunities of scientific research and discovery. It is a mistake, however, to think, as some people do, that a missionary has a good deal of leisure. This is not so. Our work always began at 6 a.m., and lasted till the going down of the sun; and the natives—if I had permitted them—would have engaged us from sunset to bedtime also. When engaged in vernacular literary work the day's duties stretched on to 9 a.m., and even to 11. However, I managed, in addition, to give some attention to philology, ethnology, geography, and climate, etc. I took barometrical and thermometrical observations eight times a day continuously for a couple of years. Having fixed the habit of taking the observations, the regularity of the work made it easy, and only took a few minutes during the whole day. I managed, also, to make a collection of birds, butterflies, beetles, and plants. These collections were not without interest and value to science. I often employed a native for this work, and paid him for his services.

One of the officers of our Missionary Committee wrote to me, and asked me to prepare a map of part of equatorial Africa, extending from the coast for about two hundred miles into the interior. Knowing an intelligent native who had led many trading expeditions into the central regions, I sent for him, and got him to give me the routes he had traversed—each day's journey, with its distance and bearings, and any special information he possessed of the localities and regions as he passed through them. The first route he gave me was from the seaboard to the Victoria Nyanza. A little before this Captain Speke had discovered the great Victoria Lake, and had laid down its southern end. I prepared a skeleton map, with only the coast-line and Speke's southern end of the "Nyanza" indicated. The man had no idea that

had the end of the lake on the paper. I took each day's distance and bearing according to his dictation for 95 days, and the moment the point of my compasses touched the linear sketch of the south end of the lake, the man—to my great surprise—said, "*Baharini*," literally meaning, at the sea, but really meaning *at the lake*! This and other routes supplied to me by this man were published in the "Proceedings of the Royal Geographical Society," with annotations by the late Keith Johnston. These routes gave me a good deal of interesting information of countries I could never visit, and of the manners and customs of peoples I could never hope to see.

I feel certain that many missionaries would feel a pleasure in communicating any knowledge of the mission field on which they are working—knowledge, in many cases, only accessible to themselves—and this society, I am glad to know, holds out its hands to help such men, and invites their co-operation.

I am glad to be present at this meeting—catholic and wonderfully cosmopolitan—and to express my hearty sympathy with its unique character and object.

Mrs. WAKEFIELD (East Africa) said: I am alarmed at being called upon to speak in such an important meeting as this. I am not a missionary—only a missionary's wife. Nevertheless, as such, it is possible for a wife to assist her husband in the scientific aspect of his

work as well as the spiritual. My memory goes back this afternoon to many instances in which, as recreation from our ordinary work, we have turned to the wonders of nature, so abundant around us.

A remarkable-looking fungus once attracted our attention, and I was ordered by my husband to make a sketch of the same, setting forth the strange shape and colour of the growth. This sketch was afterwards sent to Kew, and the fungus was reported to be "new." Encouraged by this, it was a great pleasure to notice and commit to paper anything, in the future, which appeared curious or unusual in the way of plant life. The pressing of plants and flowers also afforded us many pleasant hours. In one parcel sent to Kew, the Secretary reported the finding of "a thing unknown to science, namely, a plant without a sex." He asked for more specimens, but, to our great disappointment, we were never able to satisfy ourselves that we had rediscovered it.

In the insect department a wife may not be entirely useless to her husband. For instance, while Mr. Wakefield has been enthusiastically pursuing some marvellous specimens to add to his collection a fearful and wonderful creature of the beetle tribe has suddenly taken refuge on my breast. On calling my husband's attention to my unwelcome visitor he has callously and heartlessly cried out, "Stand still, don't move, it's a beauty!" And there, in fear and trembling, with all a woman's horror of close acquaintanceship with anything "crawly," I stood, a living entomological trap, while my companion rushed away to secure a bottle into which he might pop his newly-found treasure. One morning some men came up from our landing-place to say that a "monster" had been caught in the chain of the boat. "Bring it here," said Mr. Wakefield. "We cannot, it would take 20 men to carry it." "Then take 20 men, but bring it up here." After a while the men came toiling up to the house with the "monster" slung on a pole, and deposited it on the ground in front of the house. It proved to be an immense fish, measuring 6ft. by 9ft., with a mouth 2ft. in width, adorned on either side with two flaps, each measuring 1ft. Once more I was commanded to use my pencil, and the sketch made was sent to the British Museum. In reply we were informed that this was a *young* devil fish. The authorities would be gratified if we could secure a full-grown specimen, the skin of one having long been desired for the Museum.

I simply mention these little incidents as instances of what may be done in spare moments, with possibly double benefit, added interest and zest to the missionary's own life, and, it may be, some little assistance afforded to the great geographical and other scientific societies of our country.

Rev. F. B. SHAW, M.R.A.S. (Tibet).—The Moravian Missions have at various times performed important geographical services.

The Labrador coast has never been surveyed by Government, and the present maps are based on surveys by Moravian agents. So also for a long time in Greenland; and the Moravian missionaries, lately sent to German stations in German East Africa, are trained to survey. Missionaries are naturally keenly interested in anything concerning the country in which they live. Their success depends partly upon

their thoroughly understanding both country and people. In Western Tibet I had, of course, no exploring to do, as the whole country has been carefully mapped by Government; but I had a meteorological station under me (under the Indian Government). The stations in the Himalayas give important observations in connection with the monsoons, such as snow storms, snow in the passes, etc. Of course our interest is more on the religious side, and therefore more suited to an Asiatic Society than to a Geographical Society; still it is well to know of a place where other information is welcome.

I trust the result of this meeting will soon become apparent, and that missionaries will send to the Manchester Geographical Society any information they can. Much folklore can be obtained without either trouble or loss of time by talking to the guide or driver on one's journeys. I got a lot of information by telling fables and fairy tales, with the result of bringing out native tales in return.

The chief difficulty seems to me to lie in the time required to write down any information. The issue of a small book, pointing out concisely what information is desired and how it can be most usefully arranged, would undoubtedly be a great boon, not only by suggesting unnoticed points, but also by preventing loss of time and energy in misguided efforts. Many of us find it convenient to wait till an experienced traveller turns up, on whom the accumulating information can be unloaded. The only drawback to this system is that sometimes you are misunderstood, and you find yourself put down as authority for something you never meant to say.

With regard to the introduction of new industries to supply the wants of travellers or foreigners, I think that, as far as Ladak is concerned, very little can be done. I tried to induce the people to plant potatoes. They would not; it was not their custom, nor the custom of their fathers, and they would not depart from their customs.

Rev. F. C. SMITH, B.A. (Simisi) (Uganda), came with the intention of proposing that a pamphlet of questions be sent out. I propose direct questions, because I think most of the missionaries would feel unable to tackle some subjects. Missionaries should not be discouraged by small results. A direct question will generally secure a more or less direct answer, and might sometimes be made with good purpose and advantage. This plan of direct questioning is one which has been acted upon by Emin Pasha, Canon Tristram, myself, and others. An illustration of my meaning is supplied *re* the existence of scorpions within the countries of Uganda and Busoga. For months I searched carefully, not crediting the native report that none existed, and at length, when I began to feel that they must be right and I wrong, I indulged in unfeigned delight when an undoubted scorpion, small, but unlike in colour to any other I saw in East Africa, was brought alive to me, as a wonder. This specimen was burnt in 1891, when my large collection was destroyed, yet to this day I am persuaded that a rediscovery is in store for the fortunate finder of a rare species.

Rev. Dr. SWALLOW (China) listened to the suggestions, and will keep them in memory, but would like to add "poisons" to the subjects to be observed.

The Rev. J. INNOCENT (China) said that he came to that meeting simply with the view of learning something about the Society, and

regretted that he had not known it earlier. He felt sure that missionaries in China would willingly respond to the proposals of the Manchester Geographical Society by contributing such information as the Society desired from their respective spheres of labour.

REV. J. HUTCHEON (India) only discovered a few weeks ago, that there was such a society in Manchester, and did not come with the purpose of saying anything, but of learning about the Society, its objects and its success. I went to India at the time of the great mutiny. The value of the missionaries is now being recognised by their reports being printed in the Government blue books. One of our missionaries took the old native Canarese characters and reformed them, and he and another spent some time in London in making a complete fount of the new type. I hope to be in Manchester some time longer, and shall try to creep in again to the Parsonage. I see that your society can fully discuss missionary scientific work. I shall be glad to say something, at some future occasion, if possible.

DR. S. MACFARLANE (Tientsin) would like to see a copy of "Hints to Travellers," and was glad to have the opportunity of being at this meeting. His mission station was in Chi Chou, on the plain of Chili, North China, where they had a very cold winter and hot summer. The new railway from Hankow to Peking will pass through our part of the country, and will make our life a very different one from formerly. He was sure that all missionaries were very glad to aid in any way the grand enterprise of the noble Geographical Society.

FATHER JACKSON (Borneo).—I am deeply grateful for the very kind invitation given me by the Manchester Geographical Society to take part in this conference, for I heartily sympathise with the object for which it has been called. As an old missionary, who has travelled a good deal, I shall be pardoned for saying, I feel sure, that this honourable Society is doing a wise thing in inviting the co-operation of missionaries in its praiseworthy attempt to extend and increase geographical knowledge amongst our fellow countrymen, for it seems to me that missionaries have, as a rule, exceptional opportunities of obtaining the kind of information which is needed, and are able to communicate that information in a manner that makes it really valuable and practical.

It cannot be denied, I think, that in the past geography and its kindred sciences have been very much extended and increased by missionaries. On this point it will be enough to mention the honoured name of Livingstone, and to recall to our minds what that wonderful man did and suffered to make Africa better known to European nations, and the blessings of civilisation which have since come upon millions of the people of the African continent, as a consequence of the diffusion of that knowledge.

Missionaries of the Catholic Church have collected and published an immense amount of useful and interesting information about the countries in which they are living, but, as nearly all these missionaries were Frenchmen or Italians, or belonged to other Continental nations, and published their works in their own native languages, the information acquired by them has not been very much known in England. But I presume that the names and the work

done by Cardinal Lavigerie and Father Ohrwalder, in extending a knowledge of Africa, are known to many—the last mentioned chiefly from his book, "Ten Years' Captivity in the Mahdi's Camp," published in London two years ago.

Owing chiefly to there not being enough priests to attend to the Catholics in England, very few of our countrymen have been labouring as Catholic missionaries in foreign countries, and there are not many even now. Some years ago Cardinal Vaughan founded a society for the purpose of sending out from England priests to heathen countries beyond Europe. He is still the Superior General of that society and directs its operations. I joined his society in its early years, and was by him sent first to Afghanistan and then to Borneo, where I was in charge of our mission for about 15 years. Cardinal Vaughan has always shown a very deep interest in the extension and promotion of geographical knowledge, and took an active part in the work of the Manchester Geographical Society during the twenty years he lived here as Bishop of Salford. He has constantly urged his missionaries to collect and send home any information that could be useful or interesting to the people of this country. Some years ago, when he had called me to England on the business of the Mission, he became very much interested in what I told him about Borneo, and he wrote a letter to the *Manchester Guardian*, pointing out that, as a depression in the cotton trade was feared by many Manchester people, they might be pleased to know that Borneo and other islands near it were likely soon to be opened up, and would probably become new markets for Manchester cotton. That letter brought me an invitation to address the Manchester Chamber of Commerce, which I accepted, and I gave that distinguished body all the information I could about Borneo and its prospects with regard to trade and commerce.

At the same period I was invited by Mr. Stead, the present Editor of the *Review of Reviews*, to have a talk with him about Borneo matters, the substance of which he published in a long article in the *Pall Mall Gazette*, of which paper he was then Editor.

During the past few years the Borneo missionaries have collected and sent to Europe specimens of all the drugs used by the natives, and which they believed would be of use to medical men here.

They have also collected specimens of every kind of musical instrument found in Borneo, for the use of a lady who was writing a book for the purpose of showing the various developments of instrumental musical science, from its modest beginnings to its present state. These instruments have since found their way to the Metropolitan Museum of New York.

At the request of the late Cardinal Simeoni they have sent to the Borgia Museum, at Rome, a collection of the various kinds of weapons used in Borneo, specimens of cloth made by the native women, ornaments, chains, musical instruments, and other such objects.

A smaller collection of the same kind of objects has been presented by the Borneo missionaries, to Mill Hill College, London.

The Rev. E. Dunn, the present superior of the Roman Catholic Missions in Borneo, sent here to the Manchester Geographical Society a long paper on Borneo and its people, which was published in the Society's Journal in Vol. III., page 221.

The Rev. J. Prenger, another of the Borneo missionaries, wrote a paper on the Dusuns of North Borneo, which was read at the International Congress of Orientalists at Geneva in 1894, and which has been published at the expense of that body. I have procured a few copies of that paper, to which the members of this Conference are most welcome.

The same missionary has composed a vocabulary of the language spoken by the Dusun tribes of North Borneo, which will, I believe, be of very great value to the officers of the British North Borneo Company in their efforts to open up their territory to trade and commerce.

I mention these little facts, ladies and gentlemen, not from any spirit of boasting, but merely to show that the Catholic missionaries are in entire accord with the Manchester Geographical Society in its desire to promote useful geographical knowledge, and I feel sure that what they have done in the past may be taken as an earnest of their willingness to help in the future. At present I am not in charge of any foreign Mission, and have no missionaries subject to me, so I cannot make promises for others, but I will gladly use whatever influence I may have over missionaries of my acquaintance to induce them to co-operate, to the best of their power, in this most useful work, and in any plans which may be decided on here to-day, for its further development.

Rev. F. GALPIN (Ningpo, China).—China hitherto has not received so much attention or created such deep interest amongst the members of the Geographical Society as Africa. One reason, probably, is that thought has been centred on the Chinese people, and not on the geography of China. Comparatively few reports of travels have been published. Many missionaries may have taken notes of their journeys, but they have been unable to make their reports known to the British public. Missionary societies usually only publish reports respecting their own direct work, intended for their own subscribers. The offer of the Manchester Geographical Society to circulate reports of travels is most opportune, and if missionaries can use this opportunity to publish the information they have gained, much useful knowledge will be made known.

Another reason why so few reports of missionary journeys are published is that young missionaries do not know what information will be of most service. If a handbook of direct questions, with suggestive hints, could be prepared and circulated amongst the missionaries, it would be a great help to young men fresh in the field. I hope that this society may be able to undertake the work of preparing such a handbook.

China is a land large and varied enough to supply an enormous amount of really useful knowledge. I can illustrate this point by referring to the fact that I am now, in this most interesting meeting, sitting next to the Rev. John Innocent, for over 30 years a missionary in Tientsin—a district about 1,000 English miles from Ningpo. I have heard his name mentioned many times, but I meet him here to-day for the first time. I come from the rice swamps of Eastern China, where heavy rain and hot air produce a climatic condition, fitly called by the Chinese "the mildew season," a period when men and things are almost paralysed by mildew, and only frogs and mosquitoes

find life worth living. But my friend, Mr. Innocent, has spent his days in a region of clear, blue sky and dry air, said to be so exhilarating to Europeans that they need neither champagne or any other stimulant. Such differences of climate will show what stores of geographical knowledge await the efforts of this society. I hope that much good may result from this interesting meeting.

Rev. W. VIVIAN.—I had it in my mind to make some such suggestion as that put forward by the last speaker. If, when I went to West Africa, I had possessed a little book of the kind named, I am quite sure I could have made a much better use of the opportunities I had in the Mendi country. I had the Royal Geographical Society's "Hints to Travellers," but it was too elaborate and technical; as it was, it greatly helped me, but a simpler manual is the thing likely to be most useful. I am in perfect sympathy with the objects of this gathering.

Rev. Dr. MACFARLANE, of New Guinea.—I, also, was in a fog about this meeting, but now that I see its character I perceive its importance. The fertile brain of the energetic secretary, Mr. Sowerbutts, has originated many things in connection with this society, but none better, I think, than this gathering of missionaries of all sections of the Church who have been labouring in all parts of the world.

We missionaries are specialists, but we have time and opportunity for other studies than those specially connected with our work. As a pioneer missionary in New Guinea my work was very different from that of Mr. Wakefield. We had to survey the place before we could reach the natives. Our captain refused to take the vessel within thirty miles of the place where we formed our first mission station in New Guinea. We had to go in boats, and subsequently surveyed the place before we could take the vessel there. Then we did a good deal of geographical work, not only on the coast, discovering bays, good harbours and islands, but also in looking for suitable places for mission stations; we discovered rivers unknown to Europeans, and by planting mission stations on their banks opened them up to commerce.

As we gained influence with the natives, we led them to develop the resources of their country. I represent the London Missionary Society, which strictly prohibits its missionaries, and the captains and crews of its mission vessels, from engaging in any kind of trade, except for food and articles required by the mission, yet we develop trade by leading the natives to produce commodities for the trader, who gives them, in return, such articles as they require.

During the American international war I obtained some cotton seed from a friend, and the natives commenced growing cotton. Other friends in Manchester sent out a cotton gin for the natives, and very soon a good trade sprang up in cotton, cocoanut fibre, cocoanut oil, etc., a great benefit to all concerned.

Without neglecting his proper work, a missionary, especially in a new country, may render very considerable service to science and geography. The scientific studies come as a recreation. He soon gets interested in natural history: learns about the habits and habitats of animals, birds, plants, and fish, and is astonished to find how much the natives know about these things. Of course, few missionaries can hope to have the opportunity that I had for

geographical discovery, for it falls to the lot of but few men to visit countries of which so little was known as New Guinea when I first went there. Still, there are many missionaries who could render important service to geography and natural history, and such gatherings as this are valuable in showing how easily it can be done.

I quite agree with the previous speaker about the need for a small handbook.

PEKING AND TIENTSSEN.

THE following letter from the Rev. Sewell S. McFarlane is of interest:—
E. Sowerbutts, Esq.,

Dear Sir,—Since our meeting of the Geographical Society, when the missionaries of various denominations were invited to speak, I have intended writing you respecting two objects of interest in my travels in North China.

1st. A life-size brass mule in a temple in Peking and its uses.

2nd. The excavation of a whole row of stone statues, near my house, situated 200 miles S.W. of Tientsen.

Regarding the first. Within the walls of Peking, in a certain temple, there stands the full-size model of a brass mule. It is supposed to possess healing virtues. Persons afflicted with various diseases enter the temple, and first rub the corresponding part of the mule to that from which they are suffering, and then proceed to rub their own. The virtue passes from mule to patient. There are dozens of magnificent tablets suspended from the walls, stating in glowing terms the wonderful cures wrought thereby. One can see at a glance what are the most prevalent diseases in North China by simply observing the numerous patches on certain portions of the model. For instance, the eyeballs have been rubbed clean away and new ones substituted, showing the prevalence of purulent ophthalmia. More infection has been conveyed in this way than in any other. What the last beggar leaves behind the next patient transfers from the brass eyeballs to his own! About a dozen patches have been carefully inserted over the lumbar and sciatic regions. No photographer to my knowledge has ever been allowed to take a picture of this interesting relic, the authorities being in great dread lest the relic might be deprived of some of its virtues during the operation.

Secondly, respecting the stone statues. About two day's journey from our home, the traveller leaving the main road comes across a very interesting scene. Lining the road on either side is a long avenue of stone images, representing attendants holding the reins of saddled horses, behind which follows a drove of sheep and oxen, all life-size. My horse shied at the sight and refused to go past them. Upon inquiry at the adjoining village no trace of any recorded history could be found respecting these geological curiosities, but it is supposed that, buried beneath a field and extending a considerable distance underground, there once existed the handsome tomb of a wealthy man. These stone attendants guard the way to the sacred spot. The sheep and oxen are being led thither for sacrificial purposes. This discovery was made in a curious manner. Some agriculturists, desirous of manufacturing sun-dried bricks, commenced to dig away the earth in the said field for that purpose, when they came upon one of these stone images. As years went by more were unearched, until about thirty in all have been excavated. Were it British territory we should have discovered that tomb years ago, and brought to light every little piece of stone connected with it; but being Chinese soil, it may still lie buried till the end of time.

Should you still require any further information regarding the exact locality, etc., I might be able to obtain it from a nearer resident to the spot than myself.

I am leaving next month for Australia, as a special deputation of the London Missionary Society, and hope to be back about September. I have sent you these few facts hoping that they may prove of interest to the members of your honourable and valuable Society of research.—Wishing you every prosperity, believe me, yours heartily,

January 4, 1898.

(REV.) SEWELL S. MCFARLANE.

GEOGRAPHICAL ASSOCIATION.

THE annual meeting was held in the hall of the Society of Arts, London, on December 23rd, 1897, Mr. Douglas W. Freshfield, President, in the chair. The annual report drew attention to the important step taken by the Victoria University* in making geography a university subject by including it in the preliminary examination in place of physiography. Reference was made to the appearance of Dr. H. R. Mill's little book, "*Hints to Teachers and Students on the Choice of Geographical Books*," a work which he undertook at the special request of the Committee.

Applications for a syllabus of geographical teaching having been from time to time received, the Committee had, after much consideration, decided to print and circulate for criticism—(1) A general syllabus for secondary schools, and (2) a scheme of study setting forth the minimum of geographical knowledge that might fairly be required of a boy on leaving a preparatory school at the age of 14. The first experimental copies of coloured lantern slides, made by a new process on which the Hon. Sec. had been engaged during the past twelve months, had been approved by the Committee, and it was expected that some of the new slides would soon be ready for use. Specimens of the first four maps of the series of autograph hand-maps, designed to take the place of the unsatisfactory outline and memory maps in common use, were exhibited at the meeting, and it was stated that they would shortly be obtainable from the publisher. Arrangements were being made with Professor Dodge, of the Teachers' College, New York City, for making his "*Journal of School Geography*" better known in this country, and for supplying occasional papers and notes of special interest to British teachers. Finally, the Committee had the pleasure of announcing that Mr. Douglas W. Freshfield, late Hon. Sec. of the Royal Geographical Society, had accepted their invitation to become the first President of the Association.

In moving the adoption of the report, Mr. H. J. Mackinder, Reader in Geography at Oxford, said that it was a record of solid work and progress in a variety of ways, which would compare favourably with the results of any previous year. He was, however, disposed to question the advisability of getting geography recognised in the entrance examination at the public schools. To do so might seem to suggest that geography was an elementary subject which might be laid aside when a boy left the preparatory school. He also doubted whether it was desirable to issue any general syllabus at all. A bad teacher might wish to have a syllabus prescribed, but the inevitable tendency would be to stereotype teaching and discourage all originality. And the evil would be greater in proportion to the authority with which the syllabus was invested. With this word of warning he congratulated the Committee on the work they had done, and wished them success

* It should not be forgotten that at the Victoria University the subject is not compulsory, and not required at all after admission.—Ed., *J.M.G.S.*

in the future. The motion was seconded by Mr. A. C. Bartholomew, Reading, and carried, as was also the adoption of the treasurer's report.

The Officers and Committee for 1898 having been elected, the Chairman gave a short address, in which he traced the steps taken by the Council of the Royal Geographical Society* during the last eleven years to improve the position of geography in the educational system of the country. Their more recent policy has been to teach the teachers, and this had borne fruit in the excellent work done by Mr. Mackinder at Oxford and Reading and in London. The Council was not, however, an educational authority, nor had it much practical acquaintance with the details of teaching. For this reason it ought, he considered, to be glad to see its efforts supplemented by the Geographical Association, which had originated independently among the public schoolmasters themselves, with aims that were not too ambitious, but were thoroughly practical. After mentioning some of the ways in which the Association could do useful work, he spoke of the need for classbooks of a literary character—books like "Huxley's Physiography," which could be read with pleasure for their style, as well as for their substance; and in conclusion he acknowledged the support and encouragement which the Association had received from the Royal Geographical Society and the Royal Colonial Institute.

Dr. H. R. Mill, Librarian of the Royal Geographical Society, then gave a lecture on "Some Hints on Teaching Geography," illustrated by a variety of original lantern slides of maps, diagrams, and scenery.

The proceedings closed with a vote of thanks to the Chairman and Lecturer, proposed by the Rev. J. Ll. Dove, Haileybury, and seconded by Dr. A. V. Markoff.

NEW BOOK.

"THE YEAR BOOK OF BRITISH COLUMBIA AND MANUAL OF PROVINCIAL INFORMATION, TO WHICH IS ADDED A CHAPTER CONTAINING MUCH SPECIAL INFORMATION RESPECTING THE CANADIAN, YUKON, AND NORTHERN TERRITORY GENERALLY." By R. E. GOSNELL, Librarian Legislative Assembly, and Secretary Bureau Statistics, Victoria, B. C., 1897. Maps and many illustrations. 500 pp. and Index.

At the present time, when so much attention is being paid to British Columbia and the Yukon Mining Districts, this year-book is very opportune. The review of the early discovery and settlement of the country is most valuable; the chapter on place names is of unusual interest.

This book is a perfect mine of information on the government, the education, the Indians, the physical geography, the natural products, trade and finance, modes of communication (roads, rail, and steamboat), and the chapter on the Yukon is very useful.

The issue is to be continued, and it is intended in future issues to further develop the early history of this part of the Dominion.

* The work of the Manchester Geographical Society is not mentioned in this report.

PROCEEDINGS OF THE SOCIETY.

OCTOBER 1ST TO DECEMBER 31ST, 1897.

The 439th Meeting of the Society was held in the Library, on Monday, October 11th, 1897, at 7-30. In the chair, the Rev. S. A. STEINTHAL.

Captain H. J. CONNINGHAM, F.R.G.S., addressed the Society on "Central Asia." The address was most interesting, and kept a crowded meeting till the close. The illustrations were lantern slides, some of which were beautifully coloured and very attractive, made from Captain Conningham's own photographs.

The Rev. L. C. CASARTELLI, M.A., Ph.D., moved a most hearty vote of thanks to the lecturer for his admirable address; this was seconded by Mr. MARSDEN (Wigan), and carried. Captain CONNINGHAM responded and promised an address on "Persia" in March.

The Minutes of the preceeding Meeting (437) were passed.

The Secretary announced a large number of presentations to the Society.

The following letter from Professor Libbey was read:—

Princeton, New Jersey,

Mr. ELI SOWERBUTTS,

October 4th, 1897.

16, St. Mary's Parsonage,

Manchester, England.

My dear Sir,—I am afraid that you will think that I have entirely forgotten my promise, made about nine years ago, to write you a paper, if possible, upon the subject of "Alaska."

To tell the truth, my experiences upon that trip, aside from the interest which attached to it purely as a pleasant and profitable journey in one sense, were far from pleasant in another. My companion upon the trip, being intoxicated most of the time, was not in a condition to add to the pleasantness of the trip, and the talk which I gave before your Society, in Manchester, in 1888, was a summary more of the pleasant features of the trip, and the relation of the facts which could be observed by any ordinary traveller, in that part of the world.

I remember, very distinctly, promising at that time to write a paper upon the subject, and I also remember that upon my return to this country, when I tried to do so, I was puzzled as to how it could be done without referring to unpleasant things, that I allowed it to slip for so long a time that it hardly seemed worth while to take the matter up again.

You speak of it in connection with the Klondike, and ask me to keep my promise at the present time; but I am afraid that the information I should give you, of my own personal knowledge, would be too far out of date to be of any particular service. I hope, therefore, you will excuse me, at the present time, and I shall try and bear the matter in mind if anything turns

up up of an interesting character. Just at present I am too busy to take up anything very new, and shall be probably for the next month very much engaged.

I am very sorry that you were not able to be present at the meeting of the British Association, in Canada, because I should have been very glad to have welcomed you to Princeton after that meeting was over.

Mrs. Libbey joins me in kind regards to you and Dr. Steinthal.

Yours very truly,

WILLIAM LIBBEY.

NOTE.—The *Strand Magazine* has an illustrated article on “Klondyke.”

The 440th Meeting of the Society was held in the Library, on Wednesday, October 20th, 1897, at 7-30 p.m. Mr. THOMAS DENTITH in the chair.

The Minutes of the last Meeting were read and approved.

Notices of further Meetings were read.

Dr. W. G. BLACK, S.M., F.R.M.S., addressed the Society on “Ocean Rainfall by Rain-Gauge Observations at Sea” (see Vol. XIV., p. 36), illustrating it with a variety of rain-gauges and a set of carefully-prepared diagrams. The following are the conclusions to which Dr. Black has come on the question of oceanic rainfall:—

1. More rainfall at sea in the north hemisphere (Atlantic, Indian, and China seas) than in the south hemisphere by 91.15 in. to 66.33 in.; but there are fewer rainy days by 162 to 182.

2. The rate of rainfall is heavier in the north hemisphere than in the south hemisphere by 0.562 in. to 0.364 in. per diem of wet days.

3. The percentage of wet days to total days in north hemisphere is about 24, and in the south hemisphere is 23.

4. Most rain was collected in the month of September in the north hemisphere and in April in the south hemisphere, both being autumn months.

5. The rate of rainfall per annum in the north hemisphere was 50.56 in., and in the south hemisphere 30.76 in., or two-fifths less.

6. Least rain was collected in March in the north hemisphere and in October in the south hemisphere, both being spring months.

7. The greatest number of rainy days in the north hemisphere was in September, 33, and in the south hemisphere in April, 25, autumnal months.

8. The least wet days in the north hemisphere was in March, 5, in the south hemisphere was 1, in October, spring months.

Dr. Black also illustrated his address with the following instruments, and he explained their use: Large box rain-gauge, small leather rain-gauge gimbal stand, with ring, dish, and louvre; wind-gauge, in box.

Several questions were asked, and replied to by Dr. Black.

The SECRETARY gave an address on “An Unknown Corner of South-West Yorkshire (Saddleworth),” and illustrated it with a number of slides especially prepared for this address, from photographs taken by Mr. H. Sowerbutts and Mr. A. J. Payton, and with a six-inch Ordnance map, which had been carefully prepared.

Mr. H. T. CROOK moved a hearty vote of thanks to Dr. Black and the Secretary for their addresses; Mr. J. HOWARD REED seconded, and the motion was passed. Dr. BLACK responded.

Correspondence was read from the following:—M. H. Schmidt, Mr. F. W. W. Howell, Mr. George Thomas (books presented), Rev. F. C. Smith, Mr. H. Sowerbutts, Mr. A. J. Herbertson, Mr. W. Harper, Alderman G. Gal-
loway (books presented), Mr. J. J. Waterston, Mr. B. Mullen, Rev. A. Colbeck,
Mr. H. J. Forbes, Mr. C. Wragge, Mr. A. T. Wardrup, Mr. C. E. Schwann,
M.P., Dr. Oram, Mr. J. C. Blake, Mr. F. C. Titmas, Mrs. Zimmern, Mr. E.
J. Russell, Mr. C. Battersby, Mr. J. H. Reed, Sir M. W. Ridley, Bart. (see
Vol. XIII., p. 117), Señor F. Elguera, Mr. F. Curzon, Mr. C. H. Bellamy,
Mr. E. F. Pittman (Sydney, N.S.W.), Sir John Grindleton, the Right Hon.
Lord Derby, Miss Day, Mr. F. Hall, Mr. E. W. Mellor, J.P., General Sir
F. de Winton, K.C.M.G., Mr. W. Lancaster, junr., Mrs. A. Little (Shanghai),
Mrs. A. A. Krauss, Sir G. T. Goldie, Dr. A. W. Ward, Earl Egerton of Tatton,
Field-Marshal Lord Roberts, M. Lubin (Paris), Mr. H. Nuttall, Mr. E.
Delmar Morgan, Mr. W. D. Oliver, Mr. A. Fedotoff (Moscow), Dr. Black,
S.M., Mr. D. B. Aire (Salisbury, Rhodesia), Mr. Forbes, Señor C. Bery
(Buenos Ayres), Mr. C. H. Grinling, and Mr. F. Goodbehere.

The 441st Meeting of the Society was held in the Library, on Monday,
October 25th, 1897, at 7-30 p.m. In the chair, Mr. J. SNADDON.

The Minutes of the last Meeting were read and approved.

Correspondence was read from Sir R. Temple, Prof. Geddes, Mr. Ellam,
the Chevalier Froehlich, Mr. W. H. Parker (Borneo Co.), Mr. A. Constable, Mr.
Abel Heywood, Mr. Mellor, J.P., Mr. Garner, Rev. F. C. Smith, B.A., the
Very Rev. L. C. Casartelli, Mr. C. Roskill, Mr. Haldame, Mr. Bellamy, Rev.
S. A. Steintal, and Rev. T. Wakefield.

Presentations were announced. The election of the following members
was announced:—

ORDINARY: Mr. F. A. Fitton, F.S.A.A., and Mr. G. H. Clapham.

AFFILIATED SOCIETIES: The Educational Department, Walkden Co-
operative Society, Limited; and the Albion Literary Society.

The future Meetings in November and December were announced.

Mr. S. WELLS, F.R.G.S., of Goole, addressed the Society on "The Track
of the Moors in Spain," illustrating his address with a large number of slides
made from photographs taken by himself this year.

THE FOLLOWING ARE THE NOTES OF MR. WELLS' ADDRESS.

IN the seventh century, after the Arabians overran Africa they turned their
arms to Spain, and in twenty years they passed like a great wave over the
country, and for centuries set to the rest of Europe a shining example of
a civilised and enlightened state. There still remain in the country many
wonderful remains of palaces and buildings erected by them, although man
and Nature appear to have done their best to destroy them since the Arab left
the country. The lecturer conducted his hearers from Malaga to Seville, and
dealt at some length with the Easter processions, now one of the chief sights
of the papal world. Many views were shown of the crowded streets and
the immense figures representing biblical characters borne on men's shoulders.
After speaking on the cathedral service a bull-fight was fully described,
illustrated by a series of instantaneous photographs, showing each stage of
the fight from the moment the bull entered the ring to its death. The
various Moorish remains were visited, and the journey continued to Cordova.

Here is the largest mosque in the world, and views of it show a perfect forest of marble pillars. After a brief visit to Monserrat, with its monastery thousands of feet up the mountain side, views were exhibited of Ronda and Ceuta. At Granada considerable time was spent at the Alhambra, where the Moors made their last stand against the Christian army; it was here they handed up the keys to the Spanish monarchs and thus resigned their last hold on Spain.

Mr. S. OPPENHEIM, the Treasurer, moved a hearty vote of thanks to Mr. Wells, which, was seconded by Mr. T. C. MIDDLETON, J.P., and carried unanimously. Mr. WELLS responded.

The 442nd Meeting was held in the Library, on Friday, October 29th, 1897, at 3 o'clock p.m. In the chair, the Rev. S. A. STEINTHAL, F.R.G.S.

This meeting was held for the purpose of having a conference with a number of missionaries who have returned from active work, or who are on furlough, and who are residing, or are at present, in the neighbourhood of Manchester, and who belong to all the Christian denominations.

The object of the conference being to ascertain the views of the missionaries as to how the Society can be brought into touch with those in the field, who would be disposed to send us their geographical observations.

A large amount of correspondence was read, and a very interesting conversation took place. (See page 189.)

After the conference many ladies and gentlemen remained, and had tea with some of the members of the Council.

The 443rd Meeting was held in the Library, on Wednesday, November 3rd, 1897. In the chair, Mr. DILWORTH-HARRISON, J.P.

The Minutes of the previous Meeting were read and approved.

The election of Mr. E. F. Sharpe as an ordinary member was announced. Several presentations and additions to the Library and map-room were also announced, amongst which may be particularly noted: The Agent-General of Canada, papers on "Canada" and "Klondyke"; Mr. Henry Gray, "Old Halls in Lancashire and Cheshire"; books added to the Library; map of Asia (physical); Church Missionary Society's atlas; and Mr. Claudius Madrolle, "Travels in French Indo-China."

A letter was read from Sir F. de Winton, containing thanks for the vote of sympathy with T.R.H. the Duke and Duchess of York on the loss of H.R.H. the Duchess of Teck. Other communications were also made. The notice of the next Meeting was read.

York House,

St. James's Palace, S.W.

Nov. 1st, 1897.

Dear Sir,—I am desired, by T.R.H. the Duke and Duchess of York to thank you for your kind letter conveying the sympathy of the Manchester Geographical Society with Their Royal Highnesses in their deep affliction.

Yours faithfully,

F. DE WINTON,

Major-Gen., Comp.

E. SOWERBUTTS, Esq., Secretary.

17, Victoria St., London, S.W.,
2nd November, 1897.

Dear Sir,—I am directed by the High Commissioner to acknowledge your letter of the 1st inst., and to send you the papers we have for distribution about Klondike. Our supplies of the more important pamphlet, containing Mr. Ogilvie's report, are exhausted. As soon as a further number come to hand a copy will be sent to you.

The High Commissioner has no copies of the papers read at the British Association meetings in Toronto on the subject.

Believe me, yours faithfully,

J. G. COLMER.

E. SOWERBUTTS, Esq.,
16, St. Mary's Parsonage, Manchester.

Professor P. GEDDES addressed the Society on "Cyprus: Some Notes of Thought and Action in the East." The lecture was illustrated with a large map of Asia and by drawings on the blackboard.

At the close of his address several questions were asked, to which the Professor replied.

Mr. C. H. STOTT moved a vote of thanks to Professor Geddes; Mr. PICKERING seconded the motion, and it was supported by the Armenian pastor and Mr. O. ANDREASIAN, J.P. It was carried unanimously. The Professor responded.

The 444th Meeting of the Society was held in the Library on Monday, November 8th, 1897, at 7-30 p.m. In the chair, Mr. J. D. WILDE.

The Minutes of the last Meeting were read and approved.

The election of Mr. James Wilde and of Mrs. W. Murphy as Ordinary members was announced.

The presentation by Miss Romley Wright of a small book on Finland was announced, and additions of maps to the maproom.

Mr. HERMANN WOOLLEY, F.R.G.S., etc., addressed the Society on "A Journey through the Central Caucasus," illustrating his address with a very fine set of lantern slides, made from photographs taken by him in his journeys in that country. The address was of a most interesting character, and was listened to with great attention.

The CHAIRMAN referred to the fine quality of the views, and to the great value from a geographical point of view of the address, and a vote of thanks was carried to Mr. Woolley with acclamation. Mr. Woolley responded.

Correspondence from Lieut-Colonel Watson, Captain J. M. Vallentine, Mr. Hale, and others was read, and notice of the next meeting was given.

The 445th Meeting of the Society was held in the Library on Wednesday, November 17th, 1897, at 7-30 p.m. In the chair, Mr. Alderman Bowes.

The Minutes of the previous Meeting were read and approved.

The presentation of a large number of Foreign Office papers by Mr. Sutton was announced.

The election of Mr. A. Fedotoff, of Moscow, as a Corresponding member, was announced.

Correspondence from Sir Forbes Adam, Mr. Stanford, the Authors' Syndicate (*re* Jackson), Mr. Goodbehere, Mr. W. Lancaster, the Literary and Philosophical Society, and others was presented.

Mr. C. H. BELLAMY addressed the Society on "The Rhine from its Source to the Sea," and illustrated the address with slides made by Mr. Payton from photographs taken by Mr. Bellamy in his journeys. The address was listened to with great attention.

Mr. J. HOWARD REED moved a very hearty vote of thanks to Mr. Bellamy, one of the Victorians, who, as the Secretary had remarked, was doing large service to the Society as a Victorian, and to Mr. Payton for his kindness in preparing the slides. Mr. KIRKHAM (a visitor) seconded the motion, which was supported by Mr. J. D. WILDE, and carried. Mr. BELLAMY responded.

The HONORARY SECRETARY (Mr. Wilde) then presented the certificate of membership to Mr. Fedotoff, who responded by expressing the pleasure he had formerly had in joining the Society's work, and his thankfulness for this mark of kindness by the Society, remembering that the duty of a corresponding member was to correspond.

Notice was then given of the next meeting.

The 446th Meeting of the Society was held in the Library on Monday, November 22nd, 1897, at 7-30 p.m. In the chair, the SECRETARY.

The Minutes of the last Meeting were read and approved.

The election of the following members was announced:—

ORDINARY: Mrs. Willoughby and Mr. Thomas Rushton.

Correspondence from the Authors' Syndicate, Mr. F. Curzon on Yorkshire Village Libraries, Senores Cordeiro and Vasconcellos (Lisbon) on the Vasco da Gama Celebration next May, was submitted.

Mr. MARK STIRRUP, F.G.S., addressed the Society "On his Recent Visit to Finland" in connection with the International Geographical Society. Mr. Stirrup illustrated his address with photographs, books, and maps.

The SECRETARY gave a short account of Vasco da Gama's Voyage to India, and made extended reference to the Lisbon letter on the da Gama Celebration in that city next May.

The following communications were read:—

YORKSHIRE VILLAGE LIBRARIES.

In 1837 the Mechanics' Institutes of Yorkshire were embraced in a Union to aid the Voluntary work of Education. In the Institutes thus united a large proportion of the elementary instruction was done, the night schools in the Institute comprising many thousands of students.

The success attending the Union encouraged the Council to attempt to cultivate a love of reading in the villages of Yorkshire, and a special effort was made to establish the Yorkshire Village Library. Prince Albert entered into the idea with great interest, and at once sent 211 volumes to assist in starting the scheme. Sir Edward Baines, Mr. James Hole, the popular Vicar of Leeds (Dr. Hook), and Mr. Thomas Dawson, President of the Leeds Institution, actively co-operated. In a short time a central library was established, and visits, in many instances repeated again and again, have been paid by the Organising Secretary to nearly a thousand

villages in Yorkshire. As the years went on the work insensibly increased, and it was soon found that, unaided by local rate or national grant, it was exceedingly difficult to sustain the work.

Her Majesty the Queen, with the sympathy she has always shown in every good work, from time to time sent special donations to the fund, in several cases selecting the books to be read by the poor villagers.

At first it was difficult to find readers for the books. Now the claimants are so numerous that the supply becomes every year less adequate to the demand. The central store now occupies a suite of six rooms, and contains nearly 40,000 volumes. Of these 8,000 are always in circulation, and 2,000 volumes are always under repair. A person is daily engaged in the offices to renew the books. The boxes necessary for the transmission of the books number nearly 300, and the cost of each box, supplied by tender, is 10s. 6d. each. The boxes are cloth-lined, iron-bound at the edges, and clamped, fitted with special bolts and screws, able to contain 50 volumes. It has been adopted by the School Board of London and the University of Oxford. Every box of fifty books is accompanied with a tabulated form in which the circulation of the books can be accurately entered. A few copies of this sheet are issued to the delegates in conference.

The most important consideration is the character of the literature sent to the villages. Even now, with the advantages of education and innumerable publications, the books most popular with the villagers are not works of a very profound kind, Scott, Dickens, Thackeray, Kingsley, Jules Verne, Marryat, Mayne Reid, Strange Winter, Edna Lyall, Mrs. Linnæus Banks, Rhoda Broughton, Annie Swan, Sir Walter Besant, Mrs. Henry Wood, Rider Haggard, Mrs. Oliphant, Mrs. Hungerford. Of some of the more voluminous authors, only the very best works are bought. It is found that Scott and Dickens still retain a supreme place in the estimation of the villagers. It must be remembered that the readers in these remote and thinly peopled villages embrace every variety of the working population—ploughmen, boatmen, quarrymen, colliers, weavers, masons, and mechanics.

One room, containing three thousand volumes, is entirely devoted to works of a more solid kind—Science, especially text books on the textile industries, history, biography, poetry, travels, etc.

This room is placed at the disposal of students from any of the affiliated institutes entirely free of charge, and into every box sent out some of the more serious works are included in order to encourage a higher taste in reading.

To the more distant and sparsely peopled villages all hope of the adoption of the Public Libraries Act is out of the question, nor is it possible to group them, as the distances they are apart from each other renders the circulation impossible, nor are the Parish Councils likely to be of any immediate or permanent use. Five hundred and twenty special appeals have been made to the Parish Councils of Yorkshire. Not a single response has followed, nor has any attempt been made to found a library.

Under these circumstances no other means of reaching these villages but an organisation similar to that of the Yorkshire Village Library is possible, and the work can never be made a commercial matter, or be anything but a partially benevolent institution.

The annual cost of the 200 volumes sent to each village is about £3. The money paid by each village is 21s. a year, and to this has to be added

the expense of carriage, amounting to about 8s. more. Nearly £10 a year is spent by the Union in the removal of the boxes from the various railway stations to the offices, or in payment to the village carriers.

An approximate idea of the annual cost of working the Yorkshire Village Library, including rent, lighting, coals, officials, printing, binding, repairing, and stationery, may be roughly estimated at £600.

FRANK CURZON, Organising Secretary.

Cher Monsieur et honoré collègue,

Comme nous avons eu l'honneur de vous l'annoncer dans le temps, la célébration du quatrième centenaire de la découverte du chemin maritime des Indes, a dû être transférée. Au lieu de la date arrêtée d'abord, le 8 juillet 1897, anniversaire du départ de Lisbonne de l'expédition navale qui, sous le commandement de Vasco da Gama, a réussi dans cette glorieuse entreprise, on a choisi l'anniversaire de l'arrivée de cette expédition à Calicut, le premier port de l'Inde où elle est entrée. C'est donc l'année prochaine, au mois de mai, le 17, le 18, le 19 et le 20, que le Portugal commémorera ce grand événement qui constitue une des plus remarquables gloires de son histoire et un des plus grands services rendus à la géographie, au commerce et à la civilisation universelle.

Il n'a pas été apporté de modifications essentielles dans le plan général de la célébration que nous avons eu également l'honneur de vous exposer, et pour lequel nous comptons toujours sur l'adhésion cordiale de tous les esprits sincèrement attachés à la justice et à la fraternité humaine, et dévoués à l'avancement de la science et de la civilisation moderne.

Les sociétés de géographie tout particulièrement, qui représentent si brillamment le mouvement d'étude et d'exploration géographique du siècle actuel, ne refuseront certainement pas de prendre part à cette grande commémoration dont l'initiative est partie justement d'une d'elles: la Société de Géographie de Lisbonne.

Indépendamment des réjouissances populaires et publiques, qui se réaliseront dans tout le territoire portugais, à la métropole et aux colonies, il y a lieu d'espérer que les diverses puissances maritimes, honorant le nom du grand amiral qui a découvert l'Inde, se feront représenter à cette occasion par des navires de guerre dans le vaste estuaire de notre Tage qui peut abriter les plus grandes flottes du monde.

Nous tiendrions beaucoup à ce que les grandes compagnies de navigation voulussent aussi rendre un hommage semblable à la mémoire de ceux qui ont tant contribué pour le progrès et l'expansion de la navigation et du commerce modernes. Elles seraient d'ailleurs en mesure d'amener et d'entretenir, avec beaucoup de commodité, bien des personnes qui voudraient visiter Lisbonne et retireraient de cela des bénéfices compensant largement l'envoi à Lisbonne de quelques-uns de leurs paquebots.

En outre, on organisera de grandes régates internationales pour lesquelles il sera institué un nouveau prix international et perpétuel, la coupe Vasco da Gama, belle et coûteuse œuvre d'orfèvrerie portugaise dans le style manuelino (règne D. Manuel), 16^{me} siècle.

Trois congrès seront tenus à Lisbonne: le congrès international de la paix, celui de la presse, et la conférence inter-parlementaire pour la paix et l'arbitrage.

Un des numéros du programme que nous vous adressons a dû être remplacé par suite de circonstances imprévues et de puissants motifs, c'est celui de l'exposition générale qui était projeté et ne peut plus avoir lieu. A la place de cela, il y aura d'autres manifestations telles qu'une grande kermesse (foire) populaire et l'exhibition vivante de types, de costumes et d'industries traditionnelles, non seulement du Portugal, mais encore des différents peuples des possessions portugaises.

Il sera construit un aquarium pour l'exposition et la culture d'espèces maritimes et fluviales, dont l'exploitation et l'entretien seront confiés à la Société de Géographie de Lisbonne, comme un monument destiné à perpétuer la commémoration.

Un autre monument de celle-ci, déjà sous la présidence de Sa Majesté le Roi, le 8 juillet dernier, anniversaire du départ de Vasco da Gama, c'est le nouvel hôtel de la Société de Géographie et de son musée, où auront lieu les principaux actes de la célébration.

Renouvelant nos précédentes demandes nous osons espérer que vous et votre illustre société daignerez maintenir votre adhésion et votre inestimable concours, et que vous voudrez bien contribuer pour que votre noble pays s'associe à la commémoration du grand événement géographique, dont l'importance universelle dans l'histoire de la géographie et de la civilisation moderne est parfaitement connue de tous.

Veuillez agréer, cher monsieur, l'assurance de notre estime et de notre considération distinguée.

Pour la Commission Centrale Exécutive du Centenaire,

Les Secrétaires,

LUCIANO CORDEIRO,

ERNESTO DE VASCONCELLOS.

Hearty thanks were tendered to Mr. Stirrup and the Secretary. Mr. Stirrup responded.

The 447th Meeting of the Society was held in the Library on Wednesday, December 1st, 1897. The Rev. S. A. STEINTAL in the chair.

The Minutes of the last Meeting were read and approved. The election of new members was announced.

ORDINARY: Dr. Edgar Helme, Mr. Walter Laverson, and Mr. G. S. Ipliejian.

Letters were read from Mr. G. Lee, Mr. C. H. Bellamy, Rev. S. A. Steintal, Dr. F. H. Worswick, Mr. E. J. Russell, Mr. T. Weir, Mr. F. A. Bruton, Chevalier Froehlich, Mr. R. T. Heys, Mrs. Little, Mr. F. Zimmern, Mr. G. E. T. Smithson, Miss Birley, Mr. C. A. Clarke, Mr. J. L. Ward, Mr. W. H. Williamson, Mr. C. T. J. Garner, Mr. Herford, Mr. M. Stirrup, Miss L. S. Churchill, and from Mr. W. Potter, enclosing a view of the grave of the late Baron von Müller, of Melbourne; also a communication from Mr. R. D. Oldham on the Earthquake in India.

The Very Rev. L. C. CASARTELLI, M.A., Ph.D., the delegate of the Society to the Congress of Orientalists, read a report of the proceedings of the late International Congress of Orientalists at Paris. (See page 183.) Dr. Casartelli placed on the table a number of communications from the Congress, and his address was illustrated with a fine set of lantern slides prepared by Mr. Payton.

THE SECRETARY read a short account of the lives of John and Sebastian Cabot, and laid on the table a copy of the Customs Roll of the Port of Bristol, 1496-1499, in which are several entries of payments made to John Cabot, thus settling the much-disputed point whether Cabot died on the return voyage from America. This document has just been discovered, and has been printed in fac-simile. The Society's copy of the Cabot Roll is No. 47, 150 having been printed. The Secretary read Mr. R. D. Oldham's paper on the "Earthquake in India on the 12th of June." (See page 142.) The Cabot and Indian papers were illustrated with maps and pictures.

DR. CASARTELLI suggested that the name Cabot was probably not a proper name at all, but simply meant pilot, "Cabotti" being the Italian name for deep-sea pilot.

Questions were asked and replied to, and very hearty thanks were given to Dr. Casartelli and the writers of the other papers.

The 448th Meeting of the Society was held in the Library on Monday, December 6th, 1897, at 7-30 p.m. In the chair, Mr. WM. MOSLEY (Cheadle).

The Minutes of the last Meeting were read and approved. The election of Mr. Henry Fildes and Mr. J. Mastin as ordinary members was announced.

Letters were read from Mr. L. B. Wells, in reference to a new map of navigable rivers and canals in England and Wales; Mr. S. Oppenheim, Mr. R. S. Derbyshire, Mr. R. L. Jeffries, Very Rev. L. C. Casartelli, M.A., Ph.D., Mr. F. J. Payton, Mr. R. H. Knowlson, Dr. J. Sutherland, The Vice-Chancellor of Victoria University, Mr. E. J. Russell, Mr. W. Laverton, Mr. A. K. McAdam, Mr. J. Chorlton, Mr. F. Zimmermann, Mr. C. Collman, German Consul, Mr. F. Scott (Secretary of the Manchester and Salford Sanitary Association), Mr. J. Clarke, Mr. J. C. Blake, Mr. G. T. Lomas, Mr. S. L. Coulthurst, Mr. T. F. Nicholas, the City Treasurer, Mr. J. Watson, Mr. F. A. Bruton, the Right Hon. the Lord Mayor, Mr. E. Prestage (presenting L. Cordeiro's "Como se perdu Ormuz"), Mr. J. B. Latham (Paris), the Minister of the Colonies of France, announcing the gift to the Society of a new map of the mouths of the Niger.

A paper by M. J. de Mendizábal Tamborn, on the "Question of the Reform of the Calendar," one by Mr. J. B. Latham (Paris), on a "Journey from Paris to Buda-Pest," and one "From Buda-Pest to the Tatra Mountains," illustrated with photographs and lantern views, were read.

Announcements of future meetings were made.

MR. REITLINGER moved a very hearty vote of thanks to Mr. Tamborn and Mr. J. B. Latham, which was seconded by the SECRETARY, and passed.

The 449th Meeting of the Society was held in the Large Hall of the Town Hall, Albert Square, on Wednesday, December 8th, 1897, at 7-30 p.m. In the chair, the Right Hon. the LORD MAYOR (Alderman Gibson).

The election of the following members was announced:—

ORDINARY: Mrs. Harry Nuttall, Mr. F. Platt-Higgins, M.P., and Mr. H. Rushworth.

CORRESPONDING SOCIETY: Southampton Geographical Society.

Dr. SVEN HEDIN addressed the Society on his "Four Years of Interesting and Perilous Adventure in Central Asia." He spoke without notes, and it was exceedingly difficult to report him.

The following extracts from an article in *McClure's Magazine* represents a part of his address:—

I started from Kashgar on February 17th, 1895, with four Turkish servants and eight fine camels. I wanted to cross from the Yarkand-Darya River to the Khotan-Darya River, over the Takla-Makan Desert. I wanted to explore this desert, which nobody had ever done. There were many legends anent it among the inhabitants on its confines—stories of ancient towns buried in the sand; and I wanted to learn if there was any foundation for these stories. I entered the desert on April 10th. We had water for twenty-five days with us, carried in iron tanks on the backs of the camels. It was all sand—moving dunes of sand. The days were very hot, the nights were bitterly cold. The air was full of dust. We crossed the first half of the desert in thirteen days, and came to a region where there were some hills and small fresh-water lakes. Here I bade my men fill the cisterns with fresh water for ten days. We then proceeded, all going well. On the second day after we had left the lakes I looked at the cisterns, and found that water for four days only had been taken! I thought we could reach the Khotan-Darya in six days, and one of my servants told me that in three days' march from where we were we should find a place where we could dig for water. I believed him, and we went on.

We found no water, and two days after our supply was exhausted. The camels got ill; we lost three camels before May 1st. On May 1st the men began to sicken. I was so thirsty that I drank a glass of the vile Chinese spirit. It made me very ill. We only proceeded four kilometres that day—early in the morning. My men were all weeping and clamouring to Allah. They said they could go no farther; they said they wanted to die. I made them put up the tent, and then we all undressed and lay down naked in the tent. During that day we killed our last sheep, and drank its blood. We all thought to die. I thought I would do my best to go as far as possible.

I had to abandon much of my luggage—5,000 kroners' worth—for the camels were too weak. But I took my most important instruments with me, all my Chinese silver, my maps, and my notes. That night another camel died. I was ahead, carrying a torch to lead the way. In the night a third man gave in, and lay down in the sand and motioned to me to leave him to die. Then I abandoned everything—silver, maps, and note-books—and took only what I could carry: two chronometers, a box of matches, ten cigarettes, and a compass. The last of the men followed. We went east. The man carried a spade and an iron pot. The spade was to dig for water; the iron pot held clotted blood, foul and putrid. Thus we staggered on through the moving dunes of sand till the morning of the 2nd of May.

When the sun rose we dug out holes in the sand, which was cold from the frost of the night, and undressed and lay down naked. With our clothes and the spade we made a little tent, which gave us just enough shelter for our heads. We lay there for ten hours. At nightfall we staggered on again, still toward the east. We advanced all the night of the second, and the morning of the third of May. On this morning, as we were stumbling along, Kasim suddenly gripped my shoulder and pointed east. He could not speak.

I could see nothing. At last he whispered, "Tamarisk!" So we walked on, and after a while I saw a green thing on the horizon.

We reached it at last, but we could not dig. It was all sand, yards deep. But we thanked God, and manched the green foliage; and all that day we lay naked in its shadow. At nightfall I dressed, and bade Kasim follow. He lay where he was, and said not a word. I left him and went east. I went on till one in the morning. Then I came to another tamarisk, and as the night was bitterly cold I collected the fallen branches and made a fire. In the night my companion came up. He had seen my fire. He did not speak. I did not speak. We had no interest to talk. It was impossible to do so, for our mouths were as dry as our skins. That night we walked on for several hours, and so on till the sun grew hot on May 4th, when we again lay down naked on the sand. On the night of May 4th we advanced, crawling on all fours, and resting every ten yards or so. I meant to save my life. I felt all along that my life could not be thrown away like that.

At last we saw a black line on the horizon, very dark and very thin, and we understood that it must be the forests of Khotan-Darya. The forest was very dense and the night black, black. I had eaten nothing for ten days; I had drunk nothing for nine. I crossed the forest crawling on all-fours, tottering from tree to tree. I carried the haft of the spade as a crutch. At last I came to an open place. The forest ended like a devastated plain. This was a river-bed, the bed of the Khotan-Darya. It was quite dry.

I went on. I meant to live. I would find water. I was very weak, but I crawled on all fours, and at last I crossed the river bed. It was three kilometres wide. Then, as I reached the right bank of the river, I heard the sound of a duck lifting and the noise of splashing water. I crawled in that direction, and found a large pool of clear, fresh water. I thanked God first, and then I felt my pulse. I wanted to see the effect that drinking would have on it. It was at forty-eight. Then I drank. I drank fearfully. I had a little tin with me. It had contained chocolates, but I had thrown these away as I could swallow nothing. The tin I had kept. I had felt sure, all the time, that I should find water, and that I should use that tin as a drinking-cup. I drank and drank and drank. It was a most lovely feeling. I felt my blood liquefying. It began to run in my veins; my pores opened. My pulse went up at once to fifty-three. I felt quite fresh and living.

Then I remembered Kasim. So I took off my Swedish boots and filled them with water, and hooked them by the tags over the ends of my spade-haft, and retraced my steps. I could walk now. But it was so dark when I reached the forest I could not find my track. I shouted "Kasim! Kasim! Kasim!" but he did not answer, and I thought he was dead. Then I made a fire in the forest—for fear of tigers—a huge fire, a splendid illumination, lighting up the mysterious darknesses of this primæval forest. It gave me great pleasure to see the fire. At sunrise I searched for Kasim, and found him. I called him. He lifted his head a little. "Water!" I cried. He shook his head. "I want to die." I shook the boots near his head so that the water splashed. Then he rose like a wild beast, and flung himself on the water vessels, and drained them one after another to the last drop. Then he fell back and would not move, though I asked him to come with me to

the pool and bathe. So I left him and went on. I took a bath, and then made for the south, down the river bed.

I walked on for three days, and did not see a living soul all the time, and lived on grass and leaves, and tadpoles when I could catch them. On the fourth day I fell in with some shepherds with great flocks. They had never seen a European before. They were very frightened at my appearance, especially at my black spectacles, and they fled to the forest. I called to them in their own language. Then they came out and asked me what I wanted. They were good to me, and gave me some milk and bread. I stopped some days with them, and heard from two merchants who arrived that at two days' ride from there they had seen a man and a white camel lying in the river bed. They had spoken to him, but he had cried only, "Water! Water!" They had given him drink and food. I recognised that this was Islam-Bai. I sent a shepherd to fetch him, and in a few days Islam arrived with Kasim and the camel. He had saved all my money, some instruments, and my maps and notes. I felt quite rich.

Having recovered his strength, Dr. Hedin set out once more into the desert, and after a seven days' march came upon the ruins of one of the old Buddhist towns, and a week later upon the ruins of another: "I consider this one of the most interesting discoveries ever made. It was certainly the most curious thing that occurred to me during my four years' journey. No traveller ever expected to find anything here, and it was given to me to discover the traces of Buddhist civilisation in a Mohammedan land—towns where, to judge from the very high point of development of the mural paintings, the state of civilisation must have been very far advanced. Buddhists the inhabitants certainly were, for some of the ornamentations are pure Buddha, and on one of the fragments in my possession is a painting of Buddha sitting on a lotus."

The Rev. S. A. STEINTHAL moved a very hearty vote of thanks to Dr. Sven Hedin for his admirable, instructive, and touching address. This was seconded and supported and carried.

Dr. SVEN HEDIN responded.

The following interesting notice of Dr. Sven Hedin appeared in *The Sketch* of December 1st, 1897.

The name of Sven Hedin, although little known in England, is in his own country pre-eminent among those hardy adventurers—Nansen, Andrée, Sverdrup, Nordenskjöld, and the rest—who of late years have done so much to enhance the century-old reputation of the Scandinavians for daring and enterprise. He is only thirty-two years old, and has already achieved much. The long journey in Central Asia, which formed the subject of his lecture at the Royal Geographical Society here, is the third expedition of exploration which he has undertaken. His first was effected when he was twenty years old. He had saved up his salary as tutor in the house of Nobel's manager at Bakoum, and applied this money—thirty-two pounds was the exact amount—to the cost of four months' ride through Persia. It is not surprising that one day he should have found himself stranded without a penny. This befell him at Kirmanshar. The principal citizen of Kirmanshar—and, indeed, the richest man in Persia—is Aga-Muhammed-Hassan, an

Arabian merchant who acts as English Agent in Persia. Hedin thought it advisable to address himself, in his difficulty, to this gentleman. Aga had never heard of such a country as Sweden, but when, in the course of the conversation, he discovered that the young foreigner was a countryman of the famous Charles XII., whose exploits are known throughout Islam, he placed his house entirely at his disposal, provided him with an escort, and gave him a big sack full of silver. Hedin describes this journey in full in his book, "*Genom Khorasan och Turkestan*," which was published while he yet a student at Upsala. In 1890 King Oscar, who has always taken a deep interest in the young explorer, attached him to a complimentary mission which he was sending to the Shah of Persia. The Shah, who had heard of



DR. SVEN HEDIN.

Photo by Horman, Stockholm.

We are indebted to the proprietors of *The Sketch* for permission to reprint this article and the portrait of Dr. Hedin.

Hedin's previous visit, and who was delighted to find that the young Swede spoke his own dialect—the Kadjar language—gave him special marks of his favour, and invited him to accompany the Court on its annual journey to the cooler mountain regions. Here Hedin scaled the famous Mount Demavend—5,465 metres high—to the amazement of the Persian nobles. On separating from the Shah, who presented him with the Order of the Lion and the Sun, Hedin rode through Khorasan and by Meshed on to Merv. In Bukhara he was well received by the Emir, who gave him a decoration. This journey is fully described in his second book, "*Kong Oscar's Beskickning till Schahen af Persien*." These expeditions were, however, merely his apprenticeship

to travelling, and, as soon as he had taken his degree as Doctor of Philosophy at the University of Berlin, he began to prepare for the real journey of exploration in Central Asia which he had long projected. He wanted to climb Mus-tag-atu, to study and map the glaciers of the Pamirs, to discover the old lake of Lop-Nor in the Gobi Desert, to explore the plateaux of Thibet, and generally to traverse Central Asia from west to east. He called a meeting at Stockholm, which the King attended, and he read a paper explaining what he wanted to do and how he proposed to do it. The King was enthusiastic, and Mr. Nobel was enthusiastic, and between them they subscribed a sum of thirty thousand kroner to pay the expenses. Hedin earned four thousand kroner more by sending articles on the way to the newspapers, so that the whole cost of the journey came to about eighteen hundred pounds. He had intended to be away only twelve months; in the result, his expedition lasted three years and seven months. It was eminently successful. Not only did he solve all the questions which he had proposed to solve, but he did much more. It is true that Mus-tag-atu beat him, and, though he tried three times over to reach the top, he never got higher than 20,000 feet, which is 5,000 feet from the summit. Among Dr. Hedin's most treasured possessions are several manuscripts and a number of fragments of mural paintings which he dug up out of the sand which enshrouds these dead, forgotten cities of the desert. It was in this desert, the Takla-Makhand, that the most perilous adventure of all that moving expedition befell the adventurer. His water supply failed him in the very heart of the waste of sand, and it was twelve days and nights before a drop of liquid of any kind passed his lips. In the day the sun was burning hot, at night the air was bitterly cold. Yet he managed to struggle on and out. Some of the way, during the last hours, he was so weak that he could only crawl on all fours. Two of his attendants died of exhaustion. He lost four of his five camels, and almost all his instruments and baggage. Yet he proposes to visit this desert again. Dr. Hedin is at present writing a book describing this journey. It will be illustrated with drawings by himself. He is a man of great energy, and an indefatigable worker. We may expect great things of him in the future.

The 450th Meeting of the Society was held in the Mayor's Parlour on Wednesday, December 15th, 1897, at 3 o'clock p.m. In the chair, the Right Hon. the LORD MAYOR (Alderman Gibson).

The Right Honourable Sir RICHARD TEMPLE, G.C.S.I., C.I.E., addressed the Society on "The Country of Cashmere." (See page 139.) The address included an account of the River Jhelum, from its source at one end of the Valley of Cashmere to its exit at the other, with an account of the several lakes connected with the Jhelum inside the valley. Some notice was taken of the altitudes and climate of the valley itself, of the ranges primarily surrounding it, and of the higher and more distant ranges that are in the secondary degree connected with the valley. Some account was given of the flora and fauna. The political bearings of the geographical position of Cashmere with reference to the approaches, first to the Yarkand, and secondly to Pamir, were examined; and an explanation given of the best approach to Cashmere from the plains of India, with reference to control of it as part of the British Empire. In conclusion, Sir Richard dealt with the survey,

trigonometrical, and topographical, which has been effected by the British Government. The address was illustrated by a panorama in oils, showing the whole valley from end to end, and with a portfolio of sketches made in the country by Sir Richard Temple. The address was a very memorable incident in the history of the Society, as no one is better able to deal with the subject than Sir Richard Temple.

A few questions were put to Sir Richard Temple, and answered by him. A suggestion was made about putting British families in the Himalayas. Sir Richard spoke strongly against such a policy. British physique, British fibre, British bone, British courage, British spirit would, he said, gradually evaporate in those regions, and two or three generations would see the race extinct. A robust race going to India would degenerate mightily. Had we pursued this policy we should have lost the Indian Empire at the time of the Mutiny. Our people stayed there just long enough to enable us to govern. Any medical man would tell them that such a policy would save money neither in civil expenditure nor in recruiting.

Mr. W. H. HOLLAND proposed a vote of thanks to Sir Richard Temple for his address, and the Rev. F. DOXEY (Bacup) seconded the motion, which was cordially adopted.

SIR RICHARD TEMPLE responded, and thanks were given to the Lord Mayor and to the Rev. S. A. Steinthal, for presiding, on the motion of Sir F. FORBES ADAM, seconded by Mr. W. JACKSON.

A vote of thanks, moved by Chevalier FROEHLICH, seconded by Alderman BOWES, was also passed to the Lord Mayor for the use of his parlour.

The 451st Meeting of the Society was held in the Library on Monday, December 20th, 1897, at 7-30 p.m. In the chair, the Rev. S. A. STEINTHAL.

Mr. W. E. HOYLE, M.A., the delegate of the Society to the British Association at Toronto, addressed the Society on "The Meeting of the Association." Mr. Hoyle briefly reported the proceedings, and then gave an account of a long and interesting excursion across North America made by him in connection with the meeting, and the address was illustrated by a series of fine lantern slides.

Very hearty thanks were given to Mr. Hoyle for his services as delegate, and for the interesting address he had given of American scenery.

The 452nd Meeting of the Society was held in the Library on Thursday, December 23rd, 1897, at 6-30 p.m.

Mr. J. D. WILDE, M.A., one of the hon. secretaries, gave the usual children's lecture, at which a large number of children were present. Mr. Wilde told the children the story of Nansen and of his wonderful journey in the Arctic Seas. The address was illustrated with a set of Dr. Nansen's own slides.

The lecture was listened to with great attention, and gave great pleasure.

LIST OF MAPS, BOOKS, JOURNALS, &c.,

ACQUIRED BY THE SOCIETY FROM JANUARY 1ST TO DECEMBER 31ST, 1897.

MAPS.

GENERAL.

Chart of the World, by Dr. H. Berghaus. 12th Edition, 1897. Revised by Habenicht and Domann. In 4 sheets. Justus Perthes: Gotha. * The Publisher.

The Geography of Mammals. Map of the Nearctic Region, showing division into three subregions. * Royal Geographical Society.

The Geography of Mammals. Map of the Ethiopian Region, showing its four subregions. * Royal Geographical Society.

EUROPE.

Tourists' Map of England, with its Railways. London: George Philip and Son, 1856. * Mr. George Thomas.

Reduced Ordnance Map of Gloucester, Cheltenham, and Environs. London: W. H. Smith and Sons. * Mr. George Thomas.

Tourists' Map of Ireland, with its Railways. London: Geo. Philip and Son, 1856. * Mr. George Thomas.

Surface Temperature of the North Atlantic Ocean and the North Sea. May, August, November, 1893; February, May, 1894. Five charts. * Royal Geographical Society.

Surface Salinity of the North Sea. May, August, November, 1893; February, May, 1894. Five charts. * Royal Geographical Society.

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222 *The Journal of the Manchester Geographical Society.*

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228 *The Journal of the Manchester Geographical Society.*

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230 *The Journal of the Manchester Geographical Society.*

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232 *The Journal of the Manchester Geographical Society*

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234 *The Journal of the Manchester Geographical Society.*

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LIST OF MEMBERS,

December 31st, 1897.

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 ABickerton, Richard
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 ABlake, Henry Neville
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 ABooth, William
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 aDyson, Samuel

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 Gibson, Alderman R., J.P.
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 Gill, T. J.
 Gleave, Joseph James
 Gleim, Fred
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 Illingworth, Walter
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THE
MANCHESTER GEOGRAPHICAL SOCIETY.

RULES.

I. OBJECT AND WORK.

The object of the Manchester Geographical Society is to promote the study of all branches of Geographical Science, especially in its relations to commerce and civilisation.

The work of the Society shall be:—

1. To further in every way the pursuit of the science; as, by the study of official and scientific documents, by communications with learned, industrial and commercial societies, by correspondence with consuls, men of science, explorers, missionaries, and travellers, and by the encouragement of the teaching of geography in schools and colleges.
2. To hold meetings at which papers shall be read, or lectures delivered by members or others.
3. To examine the possibility of opening new markets to commerce and to collect information as to the number, character, needs, natural products and resources of such populations as have not yet been brought into relation with British commerce and industry.
4. To promote and encourage, in such way as may be found expedient, either alone or in conjunction with other Societies, the exploration of the less known regions of the earth.
5. To inquire into all questions relating to British and Foreign colonisation and emigration.
6. To publish a Journal of the proceedings of the Society, with a summary of geographical information.
7. To form a collection of maps, charts, geographical works of reference, and specimens of raw materials and commercial products.
8. The Society shall not enter into any financial transactions beyond those necessarily attached to its declared object, and shall not make any dividend, gift, division, or bonus in money unto or between any of its members.

II. ORGANISATION.

9. The Society shall consist of ordinary, associate, corresponding, and honorary members.
10. A Council shall be chosen annually from the ordinary members to conduct the affairs of the Society. It shall consist of a President, four or more Vice-Presidents, a Treasurer, two or more Honorary Secretaries (including a Secretary for Foreign Correspondence), and twenty-one Councillors.
11. There shall be three Trustees elected by the Society, who shall hold office until death, disability, insolvency, or resignation. They shall be members of the Council by virtue of their office.
12. Any vacancy occurring in the Council during the current year may be filled up by the Council.

III. ELECTION OF MEMBERS.

3. Every candidate for admission into the Society as an ordinary or an associate member must be proposed by a member. The proposal shall be read out at the next Ordinary Meeting of the members, and any objection shall be forwarded in writing to the Secretary within seven days.

14. The election of members is entrusted to the Council. The names of those elected shall be announced from the chair at the next Ordinary Meeting after the election.

15. The Secretary shall within three days forward to every newly-elected member notice of his election, a copy of the Rules of the Society, and a card announcing the days on which the Ordinary Meetings will be held during the session. But the election of an ordinary or associate member shall not be complete, nor shall he be permitted to enjoy the privileges of a member, until he shall have paid his first year's subscription. Unless such payment be made within three calendar months from the date of election the election shall be void.

16. The Council shall have power to elect honorary and corresponding members.

17. Women shall be eligible as members and officers of the Society.

IV. PAYMENTS.

18. Any ordinary member shall pay an annual subscription of £1 1s., or he may compound by one payment of £10 10s. An associate member shall pay an annual subscription of 10s. 6d. The Society's year shall begin on the first day of January.

19. Members shall not be entitled to vote or to enjoy any other privilege of the Society so long as their payment shall continue in arrear, but associate members shall not vote nor shall they take any part in the government of the Society.

20. The first annual payment of a member elected in November or December shall cover his subscription to the 31st December in the year following.

21. On the first day of January in each year there shall be put up in the rooms of the Society a complete list of the members with the amount of their subscription due, and as the amounts are paid the fact shall be marked on the list.

22. Notice shall be sent to every member whose subscription shall not have been paid by the first of February, and if the arrears are not discharged by the first of July the Council may remove the member from the list of members. Any member, whose subscription is in arrear for two years shall not be entitled to receive the Journal of the Society.

V. MEETINGS.

23. The meetings of the Society shall be of three kinds—Ordinary, Annual, and Special.

24. In all meetings a majority of those present shall decide all questions, the President or Chairman having a casting vote in addition to his own.

ORDINARY MEETINGS.

25. The Ordinary Meetings of the Society shall be held once a month, from the month of October to the month of May, or oftener, if judged expedient by the Council.

26. All members whose subscriptions are not in arrear shall have a right to be present. All ordinary members shall have the privilege of introducing one visitor.

27. The order of proceedings shall be as follows:—

- (a) The minutes of the last meeting to be read and if correctly recorded they shall be signed by the Chairman.
- (b) Presents, whether of money, books, maps, charts, instruments or specimens made to the Society to be announced.
- (c) The election of new members to be declared and the names of candidates to be read.
- (d) Papers and communications to be read and discussed.

28. At these meetings nothing relating to the rules or management shall be brought forward, but the minute book of the Council shall be on the table at each meeting for the inspection of any member, and extracts therefrom may, with the consent of the chairman, be read to the meeting on the requisition of any member.

29. On occasions of exceptional interest the Council may make provision for a larger admission of visitors.

ANNUAL MEETINGS.

30. The Annual Meeting of the members shall be held at such time and place as the Council shall determine.

31. Fourteen days' notice of such meeting shall be sent to every member within the United Kingdom who has given his address to the Secretary, and notice of the meeting shall be advertised in such newspapers as the Council may direct.

32. The object of this meeting shall be to receive the Annual Report of the Council and the Treasurer's Balance Sheet, to hear the President's address, to elect the Council and officers for the ensuing year, and to transact any other business.

33. Any two ordinary members may nominate candidates for the Council or for office not later than one week prior to the day of election, and the names of candidates so nominated shall be at once put up in the rooms of the Society. The election of the Council and officers shall be by ballot.

SPECIAL GENERAL MEETINGS.

34. The Council may call a Special General Meeting of the Society whenever they shall consider it necessary, and they shall do so if required by 20 ordinary members.

35. A week's notice of the time and object of every Special Meeting shall be sent to all members. No other business shall be entertained than that of which notice has been thus given.

36. Twenty ordinary members shall form a quorum.

VI.—COUNCIL AND OFFICERS.

THE COUNCIL.

37. The government of the Society shall be entrusted to the Council, subject to the rules of the Society.

38. The Council shall annually elect a Chairman and Vice-Chairman.

39. The President or the Chairman, or any three members of the Council, may at any time call a meeting thereof, to which every member of the Council shall be summoned.

40. Seven shall form a quorum.

41. In order to secure the most efficient study and treatment of the various subjects which constitute the chief work of the Society, the Council may appoint Committees for special purposes. These Committees, with the approbation of the Council, may associate with themselves any persons—whether members of the Society or not—from whom they may desire to obtain special assistance or information. The Committees shall report to the Council the results of their proceedings.

42. The President, Chairman, Vice-Chairman of the Council, and the Honorary Secretaries, shall, by virtue of their offices, be members of all Committees appointed by the Council.

PRESIDENT AND VICE-PRESIDENTS.

43. The President is, by virtue of his office, the chairman of all the meetings of the Society. In the absence of the President, one of the Vice-Presidents may reside.

CHAIRMAN OF THE COUNCIL.

44. It is the duty of the Chairman of the Council to see that the rules are properly observed, to call for reports and accounts from Committees and Officers, and to summon, when necessary, special meetings of the Council and of Committees.

TREASURER.

45. The Treasurer has the charge of all accounts; he shall pay all accounts due by the Society after they have been examined and approved by the Council.

46. He shall see that all moneys due to the Society are collected, and shall have power, with the approval of the Council, to appoint a collector. All moneys received shall be immediately paid to the bankers of the Society.

47. The bank passbook and the book of accounts shall be laid upon the table at every ordinary meeting of the Council.

48. The accounts shall be audited annually by two members, who shall be elected at an ordinary meeting at least one month before the Annual Meeting.

SECRETARIES.

49. The duty of the Honorary Secretaries shall be:—

- (a) To conduct the correspondence of the Society and of the Council.
- (b) To attend the meetings of the members and of the Council, and minute their proceedings.
- (c) At the ordinary meetings, to announce gifts presented to the Society since their last meeting; to read the names of all new members and of candidates for admission, and the papers communicated to the Society, which have been directed by the Council to be read.
- (d) To have immediate superintendence of all persons employed, to make arrangements for the meetings of the Society, and to take charge of all maps, books, furniture and other effects.

50. It shall be the more especial duty of one of the Honorary Secretaries to conduct, as may be directed by the Council, correspondence with Foreign Societies, and with persons resident abroad.

51. In addition to the Honorary Secretaries, there shall be a paid Secretary appointed by the Council, whose duties shall be to assist the Honorary Secretaries, to issue the notices of the Council and of the Society, and to act under the instructions of the Council.

The foregoing Rules, as now amended, were approved and adopted at a meeting of the members of the Society, of which due notice had been given to the members, held in the Town Hall, Manchester, Wednesday, October 3rd, 1894.

(Signed) GEORGE, *President.*
 S. ALFRED STEINTHAL, *Chairman.*
 F. ZIMMERN, *Honorary Secretary.*
 JAS. D. WILDE, M.A., *Honorary Secretary.*
 ELI SOWERBUTTS, *Secretary.*

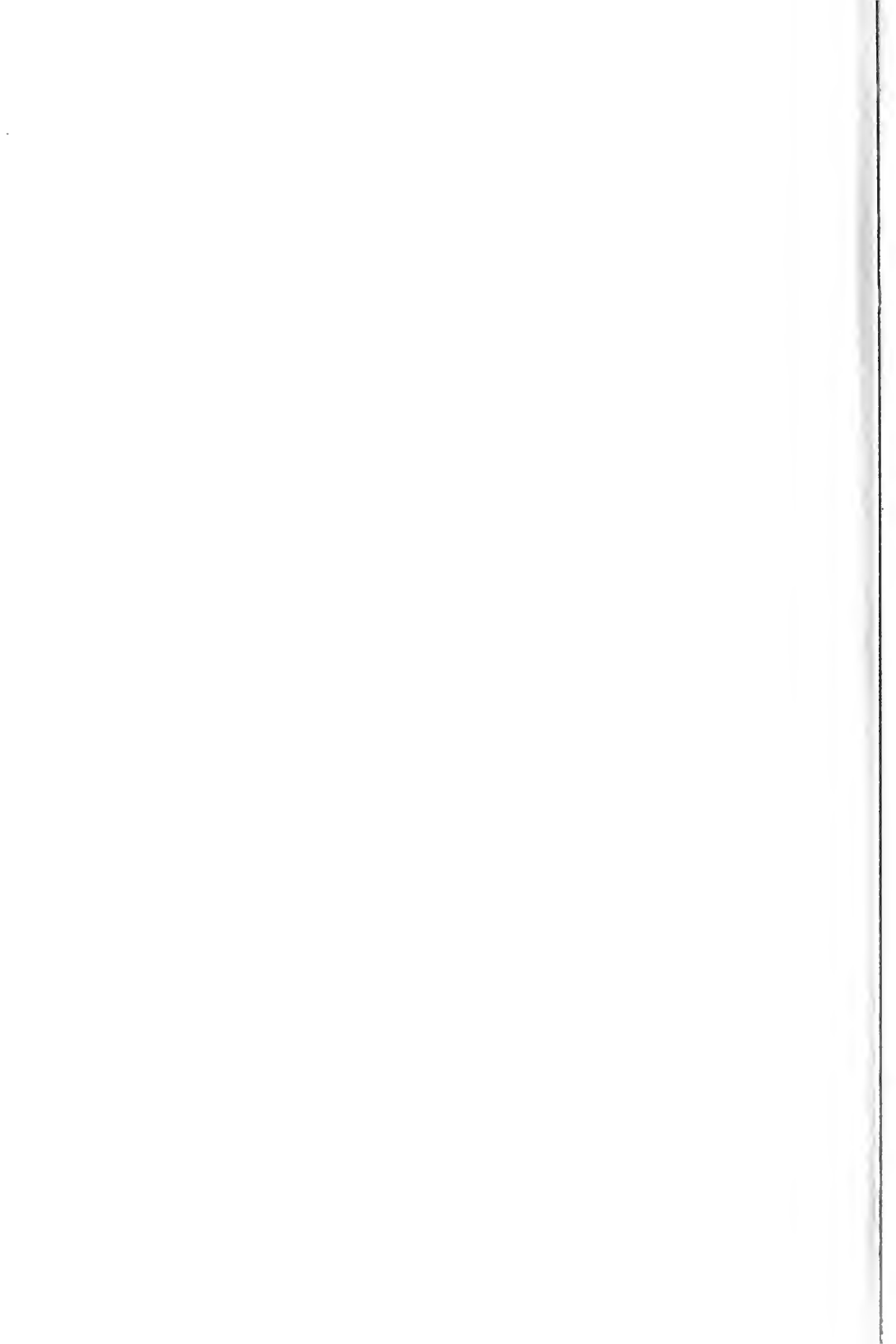
[CONT.]

It is hereby certified that this Society is entitled to the benefit of the Act 6 and 7 Vict., Cap. 36, intituled "An Act to exempt from County, Borough, Parochial, and other Local Rates, Lands and Buildings occupied by Scientific or Literary Societies."

Seal of Registry of
 Friendly Societies.

This 15th day of January, 1895.

F. W. B.









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